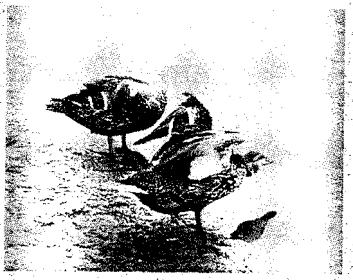
1998 Rouge River Remedial Action Plan Progress Report





ROUGE RIVER RAP
REMEDIAL ACTION PLAN

We would like to recognize the many agencies, organizations, and individuals that contributed to the completion of this document. Information sources included survey responses from local watershed governments, agencies and interest groups, the Rouge River RAP Advisory Council, the Friends of the Rouge, MDEQ, Wayne County and its Rouge Program Office, SEMCOG, and many others. Primary MDEQ staff were Cathy Bean, Carla Davidson, and Allison McCormick.

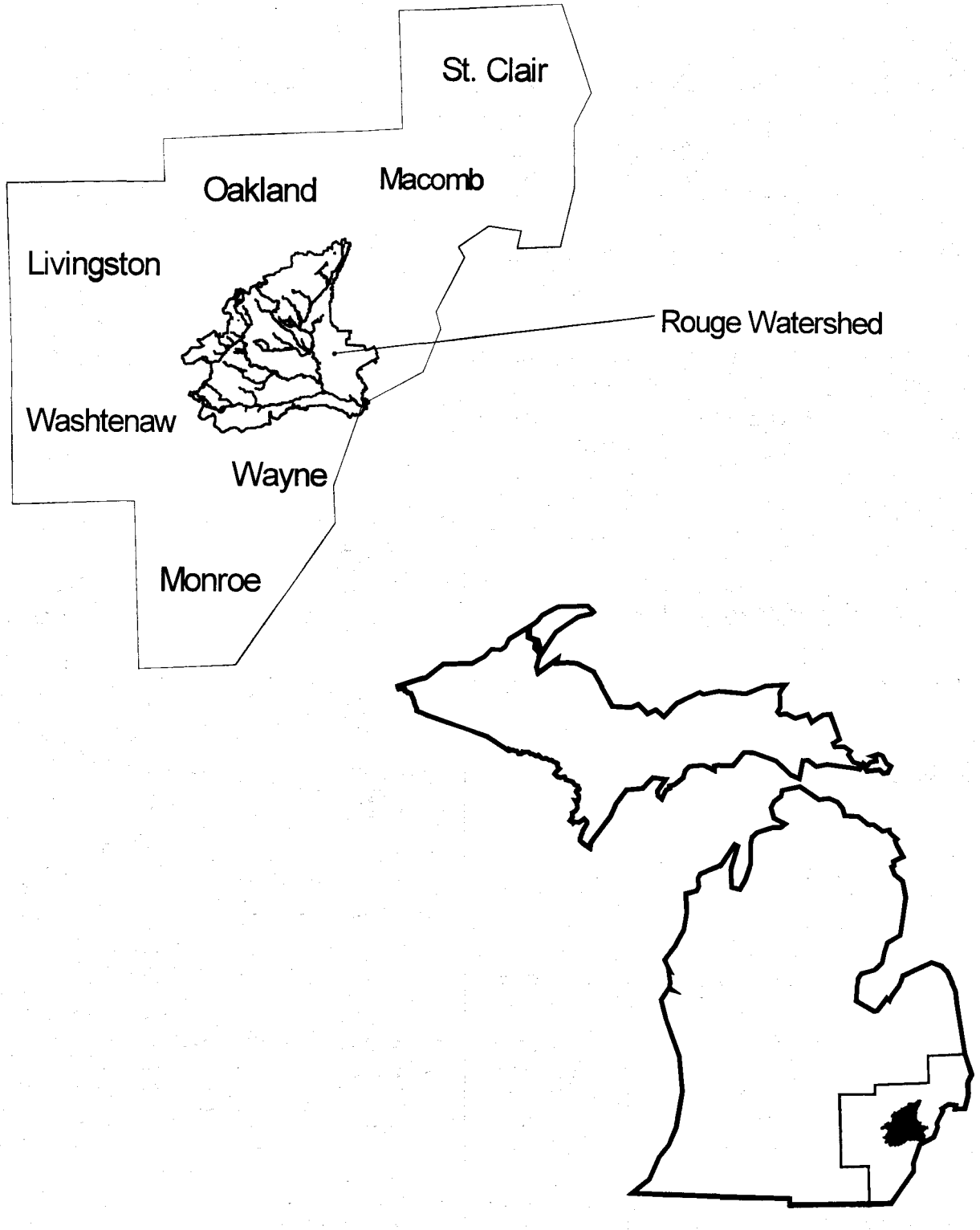
1998 Rouge River Remedial Action Plan Progress Report

"With the release of the Clean Water Action Plan earlier this year, the President reaffirmed our nation's commitment to clean water. While there is an important federal role in this effort, it will not succeed without the support of state and local citizenry, working together to improve the health of the watersheds where they live. It is just this sort of commitment I see playing out in the Rouge River. Through the continued diligence of the people who live in the Rouge River Watershed, not only will we see the goals of the RAP achieved, but these efforts will serve as a model for the rest of the country."

David Ullrich, Regional Administrator
EPA Region 5

Learning about the river

Figure 1: Rouge River Watershed Location in Michigan



OMOE	Ontario Ministry of the Environment
OSDS	On-site Sewage Disposal System(s)
PAHs	Polynuclear Aromatic Hydrocarbons - A class of toxic chemicals. Also called PNAs.
PCBs	Polychlorinated Biphenyls - A class of organic chemicals that was a commonly used additive for various types of oils.
PIPP	Pollution Incident Prevention Plan - A plan to prevent pollution of surface waters from facilities that store petroleum-based materials such as gasoline and other hazardous materials.
ppm	Parts per million - Unit of measurement for analytical data meaning one part of a contaminant in one million parts of water. Equivalent to mg/l.
ppb	Parts per billion - Unit of measurement for analytical data meaning one part contaminant in one billion parts of water. Equivalent to ug/l.
PPC	Project Performance Certification - process for ensuring that a project, such as a sewer system upgrade, will fulfill its requirements.
PRP	Potentially Responsible Party - Entity responsible for contamination of land, air, and/or water. This term is used in reference to Part 201 (formerly Act 307) sites.
RAP	Remedial Action Plan - Cleanup plan developed for a Great Lakes Area of Concern.
RCRA	Resource Conservation and Recovery Act
REP	Rouge Education Project - FOTR's school-based, interdisciplinary watershed education and monitoring effort.
RPO	Rouge Program Office
RRAC	Rouge Remedial Action Plan Advisory Council - Multi-stakeholder committee formed to assist with the update and implementation of the Rouge River RAP.
RRBO	Rouge River Bird Observatory
RRNWWDP	Rouge River National Wet Weather Demonstration Project or Rouge Project - Multimillion dollar project to determine the effects of wet weather discharges to the Rouge River and demonstrate various control measures. The project is being implemented by the Wayne County Department of Environment under a grant from the federal government.
SEMCOG	Southeast Michigan Council of Governments
SEMHA	Southeast Michigan Health Association
SPAC	Statewide Public Advisory Council - Council made up of one member from each AOC in Michigan formed to share ideas and coordinate activities between various watersheds.
SRF	State Revolving Fund
SWAG	Storm Water Advisory Group
TSCA	Toxic Substance Control Act
TSD	Treatment, Storage and Disposal facilities - Facilities that treat, store, or dispose of hazardous wastes.
U of M	University of Michigan - Ann Arbor Campus
U of M-D	University of Michigan - Dearborn Campus
USACE	United States Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
VOCs	A class of chemicals— volatile organic compounds
WACHD	Washtenaw County Health Department
WCDOE	Wayne County Department of Environment
WCDPW	Wayne County Department of Public Works
WCHD	Wayne County Health Department
WSU	Wayne State University
WTUA	Western Townships Utilities Authority
WWCCA	Western Wayne County Conservation Association
WWTP	Wastewater Treatment Plant - Facility that receives and treats wastewater prior to discharge to surface waters.
YCUA	Ypsilanti Community Utilities Authority

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Executive Summary

"We have made great strides in the past ten years toward restoring and renewing the Rouge River to the natural resource we want it to be for our children and grandchildren. All of the projects that are taking place to help restore the river will help fulfill our vision for the future. Think of it. It is possible to envision a day when hardly anyone remembers the bad old days of the Rouge River. It is even possible to envision a day when the Rouge River is considered a recreational resource without question. And it is now possible to envision a day when we won't have to Rescue the Rouge every June. Instead, we can gather at locations all over the watershed and celebrate the Rouge River. This is our vision for the future. This is our vision for tomorrow's child."

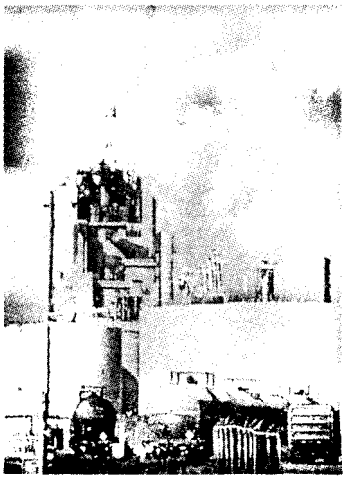
Edward H. McNamara
Wayne County Executive

Holliday Nature Preserve

Executive Summary

To help understand the current status of the Rouge River and the efforts to restore beneficial uses, it is important to recognize where we have come from. Like many Great Lakes tributaries, the Rouge River was used by early settlers as a source of drinking water and a means of transportation for the fur trade and supplies.

Beginning in the early 1900s, the Rouge River Watershed was the focal point for development of the automobile industry and the heart of the industrial revolution. This industrialization, along with rapid population growth, led to severe degradation of the river.



By the 1960s, the Rouge River was flowing orange due to the discharge of large quantities of industrial pickle liquor wastes. The orange color was evident when a boat cut a wake through the heavy waste oil floating on the surface. During this time, the Rouge River became infamous as one of the three Great Lakes tributaries to catch on fire.

Restoring the Rouge River began in the 1960s with efforts to control industrial pollution, which was perceived, at least visibly, as having the worst impact on the surface waters. An early 1970s study performed by the Michigan Department of Natural Resources (MDNR) reported that, "approximately 40 miles of the Rouge River were characterized by very poor water quality as evidenced by a macroinvertebrate community dominated by animals tolerant of severely polluted waters. The principal contaminants at that time were raw sewage and inorganic sediment entering the river via combined and/or storm sewers."

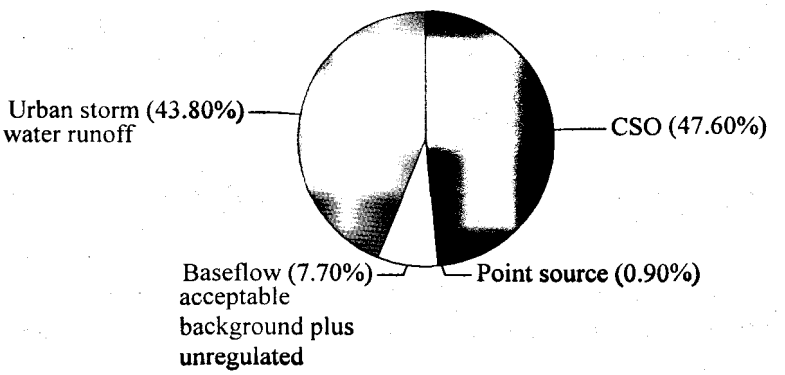
During the 1970s, the State of Michigan worked with the federal government to implement its National Pollutant Discharge Elimination System (NPDES) Program, requiring more extensive abatement programs. By the early 1980s, industries were no longer considered the major source of pollution to the river. Much of the Rouge River, however, did not meet the state's water quality standards for warmwater streams. Historically, sewers were built to protect human health and safety, not the environment. The first sewers were designed to direct disease-causing sanitary wastes and storm water away from populated areas to the nearest stream or river. Wastewater treatment plants were later built to treat the combined storm water and sewage before it reached the river. When these systems became overwhelmed during storm events, however, they were designed to discharge directly to the river without treatment. These discharges, known as combined sewer overflows (CSOs), have created significant pollution problems for the Rouge River for many years. CSOs are often the cause for the "rotten egg" smell near the Rouge River.

By the early 1980s the citizens of southeast Michigan were demanding that the MDNR do something to clean up the Rouge River. In response, the MDNR developed the Rouge River Basin Strategy that was adopted by the State Water Resources Commission on October 1, 1985. A key element of this strategy called for the development of a Remedial Action Plan (RAP) to restore uses throughout the Rouge River Watershed over a 20-year period. The Rouge River was one of 42 "hot spots" or Areas of Concern in the Great Lakes Basin

where a RAP was needed to restore uses consistent with the Canada-U.S. Great Lakes Water Quality Agreement. It was well recognized that solving the Rouge River's problems could not be accomplished in a piecemeal fashion and would require a watershed-wide approach. Later in 1985, the Commission initiated a multi-stakeholder process to develop and implement the RAP with the participation of all 48 communities (the Rouge River Basin Committee).

During the mid-1980s, emphasis was placed on sanitary sewer improvements because certain communities were having trouble transporting their sewage to main interceptor sewers. Most of these improvements have been completed and nearly all of the separate sewer overflows eliminated at a cost of over $543 million.

Sources of Oxygen Depleting Materials



Source: Rouge Program Office

The initial Rouge River RAP was completed in 1989. The document was updated in 1994 to include new information and projects and to address a broader range of issues. The RAP provided a means to increase accountability for remedial and preventive actions, track progress, and resolve conflicts in a comprehensive manner so that beneficial uses could be restored. The major emphasis during this time was on CSOs. The 1989 RAP estimated that approximately 7.8 billion gallons of combined sewage were discharged to the Rouge River annually. Wayne County recognized the need to obtain federal funding to help local governments deal with the widespread CSO problem. The federal government, in response, appropriated several hundred million dollars in grant funding for Wayne County to implement the Rouge River National Wet Weather Demonstration Project (Rouge Project). The Rouge Project, as it is known, has made it possible to significantly reduce the annual volume of CSOs at a cost of more than $392 million.

Nearly all of the initial CSO control construction projects proposed in the 1994 RAP have been or are nearing completion. Many retention/treatment basins are now in the evaluation phase to determine their effectiveness during various rain events. In general, it appears that the basins are capturing 85% of previous CSO discharges. As a result of these efforts, odor and bacterial problems have been reduced, allowing for a canoe livery to be opened in 1996 downstream of Newburgh Lake in the Middle Rouge River. This was the first time in over 25 years that partial body contact recreation was encouraged along the Rouge River.

Because of the community-based, watershed approach initiated by the RAP and the substantial progress made to date, the relative importance of different sources of pollution has changed. Because pollution caused by sanitary overflows and CSOs has been significantly reduced, other sources of pollution (e.g., urban storm water runoff, illicit connections, failing septic systems, flow, habitat loss) are becoming a higher priority.

Addressing these issues will require working with stakeholders on a subwatershed scale. When the Rouge River RAP was initiated in 1985, the Rouge River Basin Committee was established to ensure community and stakeholder participation. All 48 communities, as well as other interests, were represented on this Basin Committee. In 1993, the MDNR reorganized the RAP institutional structure into the Rouge River RAP Advisory Council (RRAC) to update the RAP and to track implementation (see Appendix D for RRAC membership). Subcommittees were formed to address specific issues such as nonpoint source pollution, contaminated sites, habitat, public education and on-site sewage disposal systems.

Subwatershed advisory groups have been formed at the subwatershed level to address local issues relating to storm water, flow management, habitat, and other locally identified issues (see Figure 3, Chapter 1 for a map of the subwatersheds). Coinciding with the startup of these local initiatives is a process to revise the Rouge River RAP. As a result of data collected in the past several years and numerous remedial actions taken, we now have a clearer picture of where we need to focus our cleanup efforts. We also need to ensure that knowledge and practical experience gained in the implementation of the Rouge RAP is reflected in the revised plan. Public participation and input will be essential in the RAP revision process. RRAC has developed a strategy for obtaining public participation in the RAP revision process which includes: (a) conducting stakeholder meetings/ workshops with the storm water advisory groups; (b) expanding RRAC membership to include more local government representation; (c) and establishing an executive committee to oversee the RAP revision process.

The foundation of the revised RAP will be the watershed management plans being developed by the storm water advisory groups. Success in this next phase of our community-based, watershed approach will in large part be dependent upon successes within the storm water advisory groups.

This Rouge River RAP Progress Report has been prepared to catalogue progress made since 1994, and celebrates our successes in an effort to sustain the momentum required to address the next phase of restoration of the Rouge River. Many issues still are not adequately being addressed. Among these are the pressures of ever-increasing urbanization, which destroys habitat and decreases fish, wildlife, and other aquatic populations. Critical habitats need to be preserved and development done in an environmentally sensitive manner. We must act quickly to address this use impairment before all vital habitats are destroyed.

It has become obvious that storm water and the pollutants that it carries must be our next major focus for restoring the Rouge. Control of this form of pollution is difficult because it is widespread, diverse, and abundant. Forty monitoring locations were established within the Rouge Watershed and results indicate that nitrogen and bacteria are still a problem in much of the river; however, biological conditions have shown improvement.

Stream flow continues to be a significant problem for the Rouge River. Development pressures increase the percent of impervious surfaces, which in turn creates more runoff. This factor has been cited as one of the major causes of decreased fish and aquatic life populations in the Rouge River. Low flows are also a problem associated with urbanization and can create significant problems for fish and other aquatic life.

We have made great strides in the education of watershed residents about their impact and what they can do to make a difference. Without educating residents about the problems and how they fit into the picture, we cannot hope for success in restoring the Rouge River.

This *Rouge River RAP Progress Report* is a continuation of a series of progress reports prepared since 1989. It highlights progress made between 1995 and 1998. A *Rouge River Report Card* will be published later this year and will summarize, in a user-friendly format, the current data on the health of the river. The revised RAP is scheduled for completion by the year 2000 and will include new goals and recommended actions for restoring the river. Please contact Cathy Bean, Rouge River RAP Coordinator, Michigan Department of Environmental Quality (734-953-1441) or Noel Mullet, Wayne County Department of Environment (313-964-8868) for further information on how you can get involved.

ROUGE RIVER RAP

REMEDIAL ACTION PLAN

Note to the Reader:

This document has been published as a progress report for the implementation of the Rouge River RAP. It includes activities from various watershed stakeholders. Although a great deal of information is contained in this document, it should not be considered one hundred percent comprehensive. The document covers progress made from 1995 to present.

The document is divided into several different sections. First, a quick reference table has been compiled to show progress made on restoration activities in the watershed. Also, a table has been compiled which shows RAP implementation projects presently underway.

The document contains a section on impaired uses, their status in the Rouge Watershed, and any progress made in implementing recommendations. A similar format is used for a section on pollutant sources that cause use impairments. Separate sections dealing with financial and institutional arrangements, education, and recreational uses are also included as areas that facilitate successful clean up of the Rouge River. Several appendices are included in the back of the document, which point the reader to other sources of information on the Rouge River.

Activities that relate to a specific goal or recommendation of either the original RAP or the 1994 Update are indicated in bold print with the specific recommendation number and letter designation at the end of each progress statement as shown below:

Example Progress Statement

 A combined sewer overflow control basin has been completed in Inkster **(Recommendation B-1c).**

Priority was designated for each use impairment and each source in the 1994 Update. These priorities have been transferred over to this document and can be found at the beginning of each use impairment or source. The use impairments and sources of impairment have also been put in their prioritized order in the document.

As was stated earlier, this document is not to be considered a stand-alone document. It is to be used in conjunction with the 1994 Rouge River Remedial Action Plan Update and the original 9-volume Rouge River RAP documents.

Table 1
Completed Projects

RAP Reference	Projects/Activities	Agency
Loss of Fish and Wildlife Habitat		
II-1c, II-2j	Michigan Environmental Conference "Practical and Cost Effective Watershed Management"	MWEA, RRAC Habitat Subcommittee
II-1c	Two seminars to enhance/preserve fish and wildlife habitats	RRAC Headwaters Subcommittee
II-4a	Purchase of enhanced wetland maps, distributed to headwater communities.	RRAC Headwaters Subcommittee
II-2o	Streambank Stabilization Project, funded by funded by FOTR, in Eliza Howell Park	FOTR, NRCS, and Detroit
II-2c, II-2q	Pilot Habitat Survey	RRAC Habitat Subcommittee Volunteers
Degradation of Fish Populations		
III-1a	Study of the fisheries potential of the river	U of M Researchers, Rouge Project
III-1f	Johnson Drain stocked with 19,393 brown trout	MDNR-Fisheries
III-1d	Caged fish studies on the main stem of the Rouge to study bioaccumulative contaminants and source	MDEQ-SWQD
III-1a	Fisheries watershed assessment	MDNR , Rouge Project
Degradation of Benthos		
IV-1	Aquatic habitat study of over 80 sites throughout the watershed	Rouge Project
Eutrophication or Growth of Undesirable Algae		
VI-1b	Establishment of an extensive monitoring network to monitor phosphorus and other nutrients	Rouge Project
Degradation of Aesthetics		
VII-1	Baseline water quality sampling efforts included water clarity, color, odor and visible debris. Report on aesthetics.	Rouge Project
VII-1b	As part of the Rouge's Reconnaissance Survey, all outfalls in over 90 miles of the Rouge were surveyed	Rouge Project
Restrictions on Fish Consumption		
VIII-1a	Extensive sediment sampling in the Middle Rouge	Rouge Project, MDEQ
Restrictions on Dredging Activities		
X-1a	Surficial sediment sampling done in October 1997 and June 1998. Information was put into the main Southeast Michigan FIELDS Sediments Database kept by USACE	MDEQ-SWQD

Table 1
Completed Projects

RAP Reference	Projects/Activities	Agency
Restrictions on Dredging Activities (continued)		
X-2a	Sediments from the Rouge Turning Basin included in MDEQ and USEPA study of sediment disposal treatment	MDEQ and USEPA
Separate Sewer Overflows		
A-1a, B-1a	Detroit Water and Sewerage Department Pump Station 2A and implementation of Detroit Flow Management Plan	DWSD
A-1b	Local sewer improvements in the Evergreen-Farmington area	Local governments
A-1c	Local sewer improvements in North Huron Valley-Rouge Valley Project	Local governments
A-1e, K-1h	Design and distribution of informational downspout brochure	RRAC-NPS
Combined Sewer Overflows		
B-1f	Sampling of influent and effluent of a CSO retention/treatment basin in Saginaw	Rouge Project
B-1a	Long Term CSO Control Program	DWSD
B-1b	Phase I interim controls used to optimize available in-system storage capacity	DWSD
B-1j, B-1h	Detroit revised its ordinance in 1996 to provide updated legal authority necessary for implementation of revised IPP	Detroit
A-1	CSO retention treatment basins and sewer separation projects (see CSO section)	County and local governments
Polluted Storm Water Runoff		
CA-1c, CA-1h	Multiple workshops on the general storm water permit for communities in the Rouge River Watershed	Rouge Project, MDEQ-SWQD
CA-1a	Combined recent data collection through the project with historical data to establish baseline water quality during wet and dry weather. Forty ambient stations and eight CSO stations being monitored	Rouge Project
CA-2b	River Basin Study for the Lower Rouge River	NRCS
Erosion		
CB-1d	Survey of the magnitude and extent of streambank erosion on the river's four major branches and selected tributaries	Rouge Project

Table 1
Completed Projects

RAP Reference	Projects/Activities	Agency
Erosion (continued)		
CB-1	Middle-1 and Lower-1 subwatersheds projects: · Conservation plans for over 2,500 acres of farmland · Over 3 acres of grassed filter strips installed to provide a buffer between crop fields and streams · Four voluntary "Farm-A-Syst" Evaluations · Presentations on water quality and soils · Over 440 Washtenaw soil surveys published and distributed	Washtenaw County, Wayne Conservation Districts and Rouge Project
On-site Sewage Disposal Systems		
CC-1, K-1	Pamphlet on proper maintenance of septic systems	Rouge Project
CC-1a	Survey to detect failing septic systems	Rouge Project
CC-1a	Map of septic systems reported in 1990, distributed to local health departments and Detroit	Rouge Project
CC-1d	Connect residences in the Village of Franklin to the sanitary sewer system	Village of Franklin, Oakland County
CC-1a	Identify the failure rate of septic systems in Farmington Hills and Southfield	SEMHA, Oakland County Health Division, Wayne County, Rouge Project
CC-1a	Second survey of septic systems in selected areas in Southfield and Farmington Hills	RRAC-OSDS and Oakland County
Contaminated Sites		
CD-6, CD-6a	Citizens Guide to Contaminated Sites packet placed in 35 libraries in the watershed	RRAC-Contaminated Sites Subcommittee
CD-5	List of recommendations for conducting public meetings	RRAC-Contaminated Sites Subcommittee
CD-5	Closure of the Warrendale dumpsite	WCDOE, MDEQ, RRAC-Contaminated Sites Subcommittee
Waste Management Division Regulated Facilities		
CG-3a	Developed *Guide for Salvage Yard Owners*	MDEQ-WMD, U of M-D Interns
Animal Waste		
CH-1a	Signs posted throughout Wayne County Parks asking visitors not to feed the wildlife in Hines Park	Wayne County Parks Division
CH-1	Elimination of Gill Farm waste	MDEQ and NRCS
Point Source Storm Water Discharges		
D-1	Point source storm water permits issued by MDEQ for 82 industrial facilities in the watershed	MDEQ-SWQD

Table 1
Completed Projects

RAP Reference	Projects/Activities	Agency
Sediments		
F-1	MDEQ-SWQD removed 6,900 cubic yards of PCB-contaminated sediment from Evans Products ditch; cleanup from 1/97 - 3/97	MDEQ-SWQD
F-1a	Sediment survey throughout the watershed	Rouge Project and U of M-D
Public Participation and Education		
K-1c, K-1j, K-1h	Education and coordination activities	
	• Rouge Riverfest at Eliza Howell Park in conjunction with Rouge Rescue '96	Rouge Project FOTR, Brightmoor Concerned Citizens
	• Rouge Project Homepage developed and on the Internet	Rouge Project
	• Movie theater ad shown	FOTR and Rouge Project
	• Over 100,000 placemats distributed to restaurants in the watershed	RRAC Education Subcommittee and Rouge Project
	• Portable display, "Our Actions Affect the Rouge" set out at over 40 communities event	Rouge Project
K-1b	River Water Festival Participants - 1,200 fifth graders	U of M-D and Rouge Project
K-1d	Observer and Eccentric Newspaper developed multi-page insert, "Changing Currents," distributed to over 160,000 homes	Observer & Eccentric Newspapers
K-1, K-2	Media Tour	Rouge Project
K-1b, K-1d	Frog and Toad Survey in the Middle-1 Subwatershed	Rouge Project and FOTR
K-1l	Recreation guide for the watershed	RRAC Education Subcommittee and the Rouge Project
Recreation		
L-2c	Fish habitat improvement project	Southfield
L-2b	Fishing derbies held in various communities	Southfield, Farmington, Farmington Hills and Wayne County Parks
Municipal Industrial Discharges		
H-1a	New general permits have been issued for five types of discharges	MDEQ-SWQD

Table 2
New, Ongoing, and Incomplete Projects

RAP Reference	Projects/Activities	Cost Estimates	Agency
Loss of Fish and Wildlife Habitat			
II-2b, II-2h	River Watch Program Adopt-a-Stream	Not estimated	FOTR
II-2, II-2j	Purchasing parcels of land for preservation, along with education	Not estimated	Southeast Michigan Land Conservancy
II-2c	Rouge River Bird Observatory Project Manager	Not estimated	Cornell Lab of Ornithology/U of M -D Superior Township and Southeast
II-2a, II-2k	Promote conservation easements along Fowler Creek and Lower Rouge	$20,000	Southeast Michigan Land Conservancy
Degradation of Fish Populations			
III-1a	Prepare a fisheries management plan	Not estimated	MDNR-Fisheries and the Rouge Project
Degradation of Benthos			
IV-1c, II-1, II-2d	Streambank Stabilization Projects		
	· Study to analyze erosion at construction sites	$60,000	Farmington Hills
	· Upstream Northville Mill Pond Erosion Control Blanket to reduce Construction site erosion	$36,500	Novi
	· Caddell Drain stream bank stabilization project	$150,000	Oakland County Drain Commissioner's Office
	· Eliza Howell Park Maintenance Program	$270,000	Detroit Recreation Department
	· Nankin Mills bank stabilization control measures	$200,000	Wayne County Parks
	· Northville Mill Pond Study	$200,000	Northville, Northville Historical Society, Northville Public Schools, and Friends of Mill Pond
	· Rogell Drain Bioengineering Project	95,000	Detroit and NRCS
	· Novi alternative bank stabilization	$90,000	Novi
	· Restoration and protection of Johnson Creek	$62,000	Washtenaw County Drain Commissioner's Office

Table 2
New, Ongoing, and Incomplete Projects

RAP Reference	Projects/Activities	Cost Estimates	Agency
Degradation of Wildlife Populations			
V-1a	Tracking bird populations	Not estimated	RRBO, Farmington area naturalists, Farmington Hills, and Ford-Sheldon Road Plant
V-1a	Marsh Monitoring Project	Not estimated	RRBO, RRAC Habitat Subcommittee, Canadian Wildlife Services and Long Point Bird Observancy
Eutrophication or Growth of Undesirable Algae			
VI-1c	Rouge Friendly Neighborhood Program - lawn fertilization	Not estimated	Rouge Friendly Neighborhood Program, Rouge Project and SOCRRA
Degradation of Aesthetics			
VII-1a	Removal of significant log jams in Wayne County	Not estimated	Wayne County
VII-1a	FOTR - Rouge Rescue	Not estimated	FOTR
VII-1a	Detroit log jam removal		Detroit
Separate Sewer Overflows			
A-1	Planned projects completed (see Table 1), but new information indicates that some SSOs still exist	Not estimated	MDEQ-SWQD and local governments
Restrictions on Fish Consumption			
VIII-1b	Newburgh Lake-Remediation/ Restoration	Not estimated	Rouge Project
Restrictions on Dredging Activities			
X-2a	City of Detroit/Detroit Coke Site Study	$50,000	MDEQ, USEPA, and Detroit
X-2a	USACE Rouge River Dredging		USACE
Fish Tumors and Other Deformities			
XI-1a	Results of fish assessment and tumors		MDNR
Combined Sewer Overflows			
B-1b, B-1c, B-1d	Initial projects to control CSO discharges/additional planning	$345,000,000	MDNR-SWQD, Local governments and the Rouge Project
B-1j	Full implementation of the Industrial Pretreatment Program	Not estimated	DWSD, MDEQ-SWQD and industrial users
B-1j, B-1h	Expansion of Incident Prevention Emergency Response Plan	Not estimated	DWSD and Wayne County

Table 2
New, Ongoing, and Incomplete Projects

RAP Reference	Projects/Activities	Cost Estimates	Agency
Polluted Storm Water Runoff			
CA-1c	Voluntary Storm Water General Permit/prototype storm water management control program	Not estimated	MDEQ-SWQD
CA-1d, CA-1h, CA-2c	Traditional polluted storm water runoff control measures evaluation:		
	· Dearborn Heights comparative catch basin cleaning and street sweeping study	$100,000	Dearborn Heights and Rouge Project
	· Redford Township Roadway Source Control Project	$150,000	Redford Township and Rouge Project
	· Livonia and Farmington Hills catch basin maintenance study	$200,000	Livonia and Farmington Hills and Rouge Project
CA-1	Local storm water management evaluation	Not revised	Counties, MDNR-SWQD and local government
CA-1a	Wet weather water quality survey	Over $9,000,000	Rouge Project and MDNR-SWQD
CA-1i	Model local storm water ordinance	$80,000	MDNR-SWQD
CA-1e	Evaluation of wetlands as polluted storm water runoff control	Not revised	Rouge Project
CA-2	Educate stakeholders about controls for storm water runoff. Conduct 4-5 storm water seminars to educate stakeholders	Not estimated	MDNR-SWQD and MDNR-LWMD, local governments, Rouge Project, and RRAC-NPS
CA-2	Soil Erosion Core Groups formed and functioning	Not estimated	MDEQ-SWQD, counties and local agencies
Point Source Storm Water Discharges			
D-1	Ensure that regulated storm water discharges comply with permit requirements for construction sites and industrial facilities	Not estimated	MDNR-SWQD

Table 2
New, Ongoing, and Incomplete Projects

RAP Reference	Projects/Activities	Cost Estimates	Agency
Stream Flow			
E-1b	Creation of wetlands to mitigate high flow storm water discharges in Inkster	Not estimated	Rouge Project, MDNR-SWQD and MDNR-LWMD
E-1b	Installation of outlet control structure at the Caddell Regional Storm Water Detention Facility	$126,000	Oakland County Drain Commissioner's Office
E-1b	Study to explore funding mechanisms for ongoing maintenance of detention ponds, training of citizens and conditions of existing ponds in Canton Township	$111,000	Canton Township and Rouge Project
E-1b	Regional detention pond for erosion	$200,000	Livonia and Rouge Project
On-site Sewage Disposal Systems			
CC-1	Failing on-site system investigations	Not estimated	RRAC-OSDS
CC-1b	Inspection guidelines and uniform construction standards	Not estimated	RRAC-OSDS
Contaminated Sites			
CD-3d	Development of a generic document for investigation and closure of abandoned dump sites	Not estimated	Wayne County Abandoned Dumps Group
Air Deposition			
CF-1a, CF01b	Quantify atmospheric deposition of pollutants of concern	Over $838,000	Rouge Project, U of M and DWSD
CF-1b, CF-1c	Continue quantifying atmospheric deposition of concern for emissions generated within the watershed	Over $600,000	Rouge Project, U of M and DWSD
Sediments			
F1-a	Intensive survey of the Middle and Lower Rouge for PCBs - sediment survey	$481,000 to date	MDNR-SWQD, MDNR-SWQD and Rouge Project

Table 2
New, Ongoing, and Incomplete Projects

RAP Reference	Projects/Activities	Cost Estimates	Agency
Sediments (continued)			
F-1b	Impoundment sediment control and removal demonstration - Newburgh Lake	$2,010,000	Rouge Project
F-1	Cleanup sites of environmental contamination, Part 201 sites, including river sediments	Not estimated	MDNR-ERD and MDNR-SWQD
Illegal Dumping/Discharges			
G-1b	Elimination of improper connections to storm drains	$302,400 to date	Wayne County Health Department
G-1a	Elimination of illegal/illicit connections to the river	$50,000	Rouge Project and Oakland County Health Department
G-1-c	Evaluation of illicit connection program	$51,000	Rouge Project
Municipal and Industrial Discharges			
H-1a	Reissue NPDES permits on a five year schedule	Not estimated	MDNR-SWQD and MDEQ
Institutions and Financing			
J-1a	Secure state and federal funding support	$205,100,000 Federal Funds, $34,550,000 in SRF funds	MDNR, USEPA, local governments and SEMCOG
J-1d	Discussion of financial and institutional arrangements to fund a watershed management system	Not estimated	Rouge Project, MDNR-SWQD, Federal Court and RRAC
Public Participation and Education			
K-1c, K-1j, K-1h	Development of public education materials and activities to promote projects and educate residents	Not estimated	MDNR, RRAC Public Education, FOTR, RRWC, SEMCOG, Rouge Project and local governments
K-1j, K-1h	Implementation of "Rouge Friendly" programs to promote stewardship	Not estimated	MDNR, RRAC Public Education, FOTR, RRWC, SEMCOG, Rouge Project and local governments
K-1	Environmental Education Institute	Not estimated	U of M-D and USEPA Region V

Table 2
New, Ongoing, and Incomplete Projects

RAP Reference	Projects/Activities	Cost Estimates	Agency
Public Participation and Education (continued)			
K-1k, L-1b	Environmental Interpretive Center	$3.5 Million	U of M-D
K-1g	Presentations about Rouge initiatives and opportunities - speaker's bureau	Not estimated	Rouge Project, FOTR and RRAC Public Education
K-3	Studying the feasibility of integrating municipal GIS and Rouge Project GIS	$129,000	Redford
K-1h	Brochures to residents about hazardous waste, recycling, composting etc.	Not estimated	Dearborn
K-1h	Promotion of proper lawn care to reduce pollutant runoff	$69,000	SOCRRA
K-1	24-hour hotline for environmental services	Not estimated	Wayne County Department of Environment
K-1, K-1p	Outreach programming for school groups	Not estimated	Wayne County Parks
K-1e, K-1p	Nature and history exhibits at Nankin Mills scheduled for 1999	Not estimated	Wayne County
K-1b	Rouge Education Project	Not estimated	FOTR and the Rouge Project
K-1	Rouge River Stewards Workshop	$100,000	FOTR, Rouge Project and HFCC
Recreation			
L-2b	Fishing derbies in Rouge communities		Wayne County Parks, Farmington, Farmington Hills and Southfield
L-1b	Canoe livery during dry weather (discontinued because of Newburgh Lake remediation activity)	Not estimated	Wayne County Parks
L-1	Walking and biking paths near the river in various communities	Not estimated	Northville, Southfield and Wayne County
L-1	Nature centers and natural areas available to visit and enjoy	Not estimated	Troy, Livonia, Dearborn, Farmington Hills, and Bloomfield Township

Chapter 1
Storm Water Advisory Group (SWAG) Reports

"The Rouge River RAP is an international model of community-based partnerships to restore impaired uses. A top priority of the RAP is to work through the subwatershed groups to identify a limited number of key action steps to restore impaired uses and to gain broad-based support for their implementation."

John H. Hartig
International Joint Commission

U. S. Representative John Dingell speaking during ***EPA Administrator Carol Browner's visit in 1996***

Figure 3: Rouge River Subwatersheds

This chapter highlights one of the most innovative and important efforts now underway in the Rouge River Watershed. In an initiative to address sources of pollution that include storm water runoff and nonpoint source pollution in a more holistic manner, municipalities and agencies have formed seven subwatershed groups to cooperatively address watershed management (see Figure 3 for a map of the subwatershed boundaries). Most communities in the watershed are participating in one or more of these storm water advisory groups or SWAGs and plan to develop their own storm water management programs under the MDEQ's NPDES General Wastewater Discharge Permit for Storm Water Discharges from Separate Storm Water Drainage Systems (Voluntary General Storm Water Permit.) As described in the Chapter 3 "Point Source Storm Water Discharge" section, this general permit will require local programs to eliminate illicit connections, replace failing septic systems, and implement a public education program to address polluted urban runoff.

Entities granted coverage under this permit will have the opportunity to demonstrate that a flexible, locally-driven program will be effective in dealing with wet weather issues. If effective, it is expected that these jurisdictions will be able to continue this local program in lieu of pending federal requirements. The advantage of taking this approach is that communities can choose what programs will be most effective in addressing local storm water issues. Otherwise, communities will likely need to comply with new federal storm water requirements that are expected to take effect in the year 2002.

In addition to the Voluntary General Storm Water Permits, another very real product of this effort is the communication that is now occurring among communities within subwatersheds, localities upstream and downstream of one another, and even those far across the watershed that find that they have similar issues with which to contend. Participants are thinking and working beyond their political boundaries more often than before.

This chapter summarizes the progress of the existing SWAGs, starting with the SWAG for the upstream portions of the Main Rouge River and ending with the downstream portions of the Lower Rouge. It should be noted that many of the groups' goals and plans are preliminary in nature and have not been adopted by the participating communities nor have undergone review by the general public. Current goals and plans will no doubt evolve as the subwatershed groups continue to work with local leaders, residents, and other subwatershed groups. The work of these groups will become part of the next revision of the Rouge River RAP, expected to be published in the year 2000.

Main 1 & 2 Storm Water Advisory Group (SWAG)

The Main 1 & 2 SWAG held its kickoff meeting on July 29, 1998. Participating communities are beginning to work on their public education and illicit connection plans and plan to submit applications for the general storm water permits by January of 1999. Other communities are undecided or plan to implement some storm water planning without submitting a formal application. Participating communities include Auburn Hills, Beverly Hills, Bloomfield Hills, Farmington Hills, Novi, Southfield, Southfield Township, and West Bloomfield Township. Note that not all municipalities listed here as "participating" have obtained approval from their governing bodies.

A number of projects to implement RAP goals are underway in these communities. See Chapters 2 through 6 for a more detailed description, organized by topic, of these projects.

Main 3 & 4 Storm Water Advisory Group (SWAG)

Communities, industries, and citizens groups in this subwatershed have formed a unique, collaborative effort to address a variety of local environmental and quality of life issues. The Wayne County Department of Environment (WCDOE) calls this effort the "Good Neighbors United Initiative" (GNUI) and is working with EPA Region V and Detroit as well as the local governments.

This group's mission is to improve the quality of life in the Main 3 & 4/southwest Detroit area by focusing federal and county governments, city/local community group efforts and local business and industrial resources on selected environmental and economical concerns of the communities and agencies. The focus area includes all or portions of the following communities: Allen Park, Dearborn, southwest Detroit, Ecorse, Lincoln Park, Melvindale, and River Rouge.

An environmental matrix was developed to rank environmental concerns and five broad-based task forces were formed to address priority issues: air, brownfields, public information/education, solid waste/illegal dumping, and water. The water task force has developed draft goals, strategies, performance measures, and progress and schedule. Priority issues include: upstream sources, public access to waterways, contaminated sediments, fish consumption advisories, storm water runoff from junkyards, and aesthetics and habitat. The first three goals are listed in more detail in Table 3. It should be emphasized that these goals are not final and have not been formally adopted.

Table 3
GNUI Water Task Force Group (Main 3 & 4 Subwatersheds)
DRAFT Goals and Progress Summary*

Goal/Priority	Strategy	Measure	Progress/Schedule
1. Address local storm water management	Collaborate with communities under Voluntary General Storm Water Permit ·Hold Voluntary General Storm Water Permit guidance meeting ·Convene subwatershed advisory group	·Development of Voluntary General Storm Water Permit applications ·Development of Main 3-4 Subwatershed Management Plan	Voluntary General Storm Water Permit guidance meeting 7/22/98
	Implement pollution and technical assistance programs ·SDEV ·Rouge Friendly/RETAP ·Rouge Friendly Neighborhood activities	·Number of businesses seeking assistance ·Number of businesses recognized as Rouge Friendly	
2. Minimize impacts of upstream sources	Utilize RRAC, RAP revision process, and others to monitor and encourage continued implementation of upstream pollution control efforts and ensure consideration of downstream impacts	·Secure representation on RRAC ·Revise RAP	Melvindale added to RRAC membership
	Collaborate with U of M Dearborn, Ford Estates and Greenfield Village to promote vision of restored uses	Development and implementation of communication strategy and materials	
3. Public access to waterways	Melvindale Park & Trail	Complete design and implementation of project	Grant proposal submitted
	U of M Environmental Interpretive Center & Programs	Complete design and implementation of project	Construction underway and grant proposal submitted
	Henry Ford Museum Oxbow restoration	Preliminary design/feasibility	Grant proposal submitted
	Automotive Heritage Corridor	Preliminary design/feasibility	Grant proposal submitted

*These goals are not final and have not been adopted by GNUI.

Upper Rouge Storm Water Advisory Group (SWAG)

The Upper Rouge SWAG includes representatives from communities in the Upper 1-2 Subwatershed: Livonia, Farmington, Farmington Hills, West Bloomfield Township, Redford Township, Commerce Township, Oakland County, Wayne County, and MDOT, as well as portions of Novi and Northville Townships. Upper Rouge SWAG stakeholders are collaborating to develop subwatershed-wide Voluntary General Storm Water Permit applications. Each entity plans to submit a similar application by January 1, 1999.

This group was reorganized in 1998 from the former "Bell Branch and Tarabusi Creek SWAG" to include communities from the Upper-1 Subwatershed. The original group represented one of three demonstration areas chosen by the Rouge Project to analyze how urbanization affects the quality and uses of the river and how opportunities for improving water quality vary among communities. (The other two demonstration areas were the Middle-1 and Middle-3.) The Bell Branch/Tarabusi Creek Subwatershed was selected to represent an area that has undergone extensive development over the last 40 years with only a few remaining undeveloped areas in the headwaters.

The Rouge Project prepared a *Draft Management Study for the Bell Branch and Tarabusi Creek Subwatershed* that summarized the work of the advisory group in October 1997. The study presented information about the subwatershed and discussed impaired uses, which included fish, wildlife, and aquatic insect habitats and populations as well as human uses of the river. Cited as important problems causing these use impairments are illicit connections, failing septic systems, extreme fluctuations in flow, erosion, sedimentation, nonpoint source pollution, and removal of vegetative buffer zones along the river. Downstream of Inkster Road, combined sewer overflows also contribute to impairment of river uses.

The management study included proposed goals and objectives for consideration of the advisory group. Although they have not been adopted by the communities nor subjected to public review, the proposed goals are indicative of members' ideas and are as follows:

- Achieve compliance with Clean Water Act requirements
- Remove sources of pollution that threaten public health
- Minimize flow variability and associated negative impacts
- Restore impaired uses by reducing pollutant loadings in storm water
- Enhance and preserve aquatic ecosystems consistent with limitations of urbanized setting
- Maximize opportunities to preserve and create community assets by enhancing recreational and other uses on publicly owned riparian lands
- Enhance and protect water quality of the Great Lakes

In addition to developing applications for the Voluntary General Storm Water Permit, communities have begun a number of pilot projects to address local storm water issues. Approved pilot projects in this subwatershed (partially funded by the Rouge Project) include the following:

- Livonia Storm Water System Evaluation
- Livonia Regional Storm Water management facility
- Caddell Drain Erosion Control Project
- Redford Township GIS/Data Management project
- Redford Source Control Program/Golf Course Management
- Redford Catch Basin Analysis

See Chapters 2 - 6 for more information on projects in the Upper Rouge Subwatershed.

The Middle-1 Storm Water Advisory Group

The Middle-1 SWAG includes representatives of the communities of Novi, Northville, Northville Township, Plymouth, Plymouth Township, Canton Township, Salem Township, and Walled Lake. This subwatershed group has been meeting since January 1996 to work toward addressing problems identified in the RAP and in other related studies. In November 1997 a Rouge Project Technical Memorandum entitled the "Middle-1 Subwatershed Management Study" (RPO-NPS-TM23.00) was written with the assistance of the Middle-1 SWAG and has been a helpful tool in prioritizing existing problems, outlining a vision for future protection and restoration goals, and identifying the current state of the Rouge River.

All communities in the Middle-1 SWAG have signed a letter of intent to apply for the voluntary Voluntary General Storm Water Permit. The permits will require developing and implementing a plan for the elimination of illicit connections, a plan for public education and involvement, and a comprehensive long-term subwatershed management plan. All SWAG communities have begun this process and are on target with their commitment to apply for the permit by January 1999. The group is meeting monthly with smaller working groups meeting in the interim to write and coordinate Illicit Discharge Elimination Plans and Public Education Plans. The group is also working with other agencies involved in the application process, such as Washtenaw, Wayne, and Oakland counties, to coordinate planning and implementation activities toward the mutual goal of cleaning up the Rouge.

The Middle-1 Subwatershed falls in the headwaters region of the Rouge River Watershed, which gives these communities a unique opportunity to focus on not only reactive and restorative efforts, but also on preventative measures to protect the river against further degradation. Some of the projects (partially funded by the Rouge Project) that are currently underway in the Middle 1 Subwatershed include the following:

- Northville Ford Park Development Passive Recreation Project
- Novi Streambank Stabilization Project
- Friends of the Rouge/Salem Township Wildlife Habitat Inventory
- Salem Township Public Awareness Project
- The Salem Township/South Lyon Schools Outdoor Environmental Education Lab
- Canton Township's Fellows Creek Regional Detention and Public Education Program
- Michigan Natural Resources Trust Fund grant to construct erosion control systems in the Walled Lake's public park beach area
- Washtenaw County's Community Partners for Clean Streams program
- Washtenaw County Drain Office's Storm Water Conveyance and Wetland Treatment Project
- The Wayne and Washtenaw counties' conservation districts' Agricultural Runoff Abatement Project

Many more projects are underway. See Chapters 2 - 6 for more information on projects in the Middle-1 Subwatershed.

Middle-3 Storm Water Advisory Group

The Middle-3 SWAG includes representatives from the communities of Dearborn Heights, Garden City, Livonia, Westland, Wayne County, MDEQ, Central Wayne Sanitation Authority, Friends of the Rouge (FOTR), and Henry Ford Community College (HFCC). Group members have been meeting since March 1996 to address water quality issues in their subwatershed.

Major challenges in this subwatershed include addressing flow fluctuations, high bacteria levels, fish advisories due to PCBs, and streambank erosion. Recreation and public use of the river are also a high priority. The SWAG has endorsed the following vision statement and proposed goals to address these issues. Note that these goals have not necessarily been adopted by local governments or agencies or undergone public review.

Vision: A Middle Rouge River and river corridor that is aesthetically pleasant and is clean, healthy and safe so that watershed residents and visitors can enjoy a variety of recreational opportunities including fishing, canoeing and picnicking, and supports a healthy and diverse fish and wildlife community.

Goals:

1. Improve water quality consistent with the vision for the Middle Rouge River.
2. Reduce public health risk and enhance recreational opportunities along the Middle Rouge River and within the subwatershed.
3. Educate the public regarding the public's impact on the river and the river's existing and future potential as a community asset and recreational resource.
4. Preserve parklands adjacent to the Middle Rouge River that are held within the public trust.
5. Enhance and preserve habitat, especially next to the river, for fish and wildlife compatible with subwatershed land uses.
6. Obtain a general permit for storm water through cooperation with other communities, Wayne County, and other stakeholders.
7. Adopt an effective subwatershed storm water management strategy that includes exploring ways to fund watershed management efforts and ensures the best utilization of public funds.

This group has been working closely with the MDEQ, Rouge Program Office (RPO), Wayne County, and the U. S. District Court to develop applications for the Voluntary General Storm Water Permit. As a result of its early initiative in RPO's subwatershed pilot effort for the Middle-3 Subwatershed, Westland became the first community within the Rouge River Watershed, the State of Michigan, and the United States to apply for a voluntary municipal storm water permit. Westland's efforts have been an excellent example and point of comparison for other communities that have just begun to develop their own application for coverage under the general permit. Representatives from Westland have subsequently helped other communities develop their permit applications by providing examples of their application and sharing their experiences.

In addition to their primary effort (preparing applications for the Voluntary General Storm Water Permit) participating communities have also been implementing a number of related programs, including the following:

- Extensive efforts to eliminate CSO discharges: Dearborn Heights' $27 million retention basin and $27.2 million sewer separations in Garden City, Livonia, and Westland
- Dearborn Heights, HFCC and FOTR's Rouge Watershed Education Center at HFCC's Dearborn Heights campus
- Dearborn Heights' Rouge Project pilot geographical information system (GIS) program
- Public education on Garden City's cable television channel
- Westland and Wayne County Parks' sediment basin
- Wayne County's study of on-site sewage disposal systems in the Tonquish Creek area
- Westland's illicit connections project
- Wayne County dye testing for illicit connections at 500 businesses in the Middle Rouge

There are many more projects underway. See Chapters 2 - 6 for more information on projects in the Middle-3 Subwatershed.

The Lower-1 Storm Water Advisory Group

The Lower-1 SWAG includes representatives from the communities of Salem, Superior, Ypsilanti, Plymouth, Van Buren, and Canton townships. These six communities formed the group in response to the RAP and the need for coordinated watershed management. The SWAG has been meeting regularly since November 1997. To establish the SWAG as a formal entity committed to protecting and restoring the Rouge, the group has developed a mission statement. Each of the communities has passed a formal resolution to pursue this mission, which reads as follows:

Mission: To enhance the quality of life in the Lower-1 Subwatershed by implementing a watershed management strategy that will characterize the positive and negative aspects of the Lower-1 Subwatershed; investigate cost-effective, innovative solutions to mitigate negative aspects; implement solutions through a proactive, cooperative partnership at the local level; develop an effective means of informing and educating persons within the watershed; and provide for long-term performance monitoring of activities.

All communities in the SWAG have signed a letter of intent to apply for the Voluntary General Storm Water Permit. All SWAG communities have begun the application process and are on target with their commitment to apply for the permit by January 1999. The group meets monthly with smaller working groups to write and coordinate their Illicit Discharge Elimination Plans and Public Education Plans. The group is also working with other agencies involved in the general permit application process, such as Washtenaw and Wayne counties, to coordinate planning and implementation activities toward the mutual goal of protecting and cleaning up the Rouge.

The Lower-1 SWAG communities fall within the less degraded headwaters of the Rouge River Watershed and thus have a unique opportunity to not only address the need for restoration activities, but also to focus on efforts to protect currently healthy natural resources and prevent their degradation. In addition to collective subwatershed efforts to clean up and protect the Rouge River, individual communities of the SWAG have continued to implement projects that address watershed-wide concerns and strive for improvements.

The communities are already implementing efforts toward this goal through projects such as conducting habitat wildlife assessments, creating environmental education and recreation opportunities, initiating and enhancing public awareness and involvement activities, and establishing water quality improvement mechanisms. The following projects and ongoing initiatives are examples of the strong commitment that the SWAG communities have made to clean up and enhance the quality of the Rouge River, its tributaries, and the environment of the subwatershed as a whole:

- The Salem Township Johnson Creek Habitat Assessment and Educational Project
- The Salem Township/South Lyon Schools Outdoor Environmental Education Lab and Interpretive Trail
- The Superior Township Site Conservation Easement Project
- Plymouth Township/Canton Township Clean Water Program
- The Canton Township Enviro-friendly Golf Course Design
- Canton Township's Watershed Management Strategy
- Ypsilanti Township has begun implementing their Storm Water Management Plan for all new developments
- Rouge River Watershed Lower-1 Subbasin Resource Plan of the Southeast Michigan River Basin Study (March, 1997; USDA)
- The Washtenaw County Drain Office Streambank Stabilization Project on Johnson Creek in Salem Township
- The Wayne County Septic System Database and Evaluation Project

There are many more projects underway. See Chapters 2 - 6 for more information on projects in the Lower-1 Subwatershed.

Lower-2 Storm Water Advisory Group (SWAG)

The Lower-2 SWAG is comprised primarily of representatives from the following communities: Dearborn, Inkster, Romulus, Wayne, and Westland. It should be noted that there are two other municipalities in the watershed, Garden City and Dearborn Heights, that have a minimal amount of land within the Lower-2. Since most of their jurisdiction is in the Middle-3 subwatershed, Garden City and Dearborn Heights have focused their watershed management efforts on working with the Middle-3 SWAG.

The Lower-2 SWAG was first formed in the fall of 1997 through the efforts of the RPO. Municipal representatives meet on a monthly or bimonthly basis to discuss cooperative means by which they could improve water quality conditions within their subwatershed. Their vision statement, similar to the Middle-3 SWAG's, is as follows:

Vision: A Lower Rouge River and river corridor that is aesthetically pleasant and is clean, healthy and safe so that watershed residents and visitors can enjoy a variety of recreational opportunities including fishing, canoeing, and picnicking, and supports a healthy and diverse fish and wildlife community.

Individually and/or as a group, the communities have progressed in the following tasks related to storm water management. In addition, CSO control efforts are also underway.

Council Action for Storm Water Management

Most of the SWAG members have met with their respective city councils, which have adopted resolutions to work cooperatively with their subwatershed neighbors in the interest of water quality improvement. These resolutions include goals for each community to pursue coverage under MDEQ's Voluntary General Storm Water Permit.

Application for Coverage under the General Permit

The community representatives from the Lower-2 have sent letters to Judge John Feikens indicating their intent to apply for coverage under the Voluntary General Storm Water Permit. In these letters, the communities have included commitments of staff and other resources to secure the permits. To match this commitment, the RPO has devoted their resources to facilitate the permit application effort and to provide the communities with maps, data, or other available resources, needed for the permit application. The Lower-2 SWAG participants plan to submit their Voluntary General Storm Water Permit applications by January 1, 1998.

Storm Water Management Programs

The communities of the Lower-2 SWAG have been very active in pursuing grants from the RPO to implement storm water management programs within their jurisdictions. Following is a summary of the progress each community has made to date in this regard.

Geographic Information Systems (GIS) Grant

Dearborn, Inkster, Romulus, Wayne, and Westland have applied for and received grant funding to complete GIS projects. These projects vary somewhat in scope but generally include purchase of GIS equipment and/or inventory and mapping of storm sewer systems. The products will be integral tools for the implementation of illicit discharge elimination programs and other watershed management efforts within the subwatershed.

Pilot Projects

Pilot projects were the first community grant projects administered by the RPO. These projects were the forerunner of the program to provide communities with grant money for the storm water projects. Westland received pilot project grant money for the design and construction of a sedimentation basin and for an illicit connection investigation. Wayne approved Rouge Project construction of a sand filter to treat storm water runoff from a city parking lot. Monitoring data has been collected but is not yet available for publication.

Storm Water Management Grants

Storm water management grants are grants made available through the RPO for the sake of implementing a wide variety of storm water projects. Inkster, Dearborn, Wayne, and Romulus have applied for these grants and have received funding to implement the following projects.

Community	Project Description
Dearborn	Ford Field bridge retrofit and implementation of illicit discharge and public education plans.
Inkster	Develop storm water ordinances, implement illicit discharge and public education plans for water quality improvement, implement storm drain stenciling program.
Romulus	Develop storm water education and catch basin stenciling programs, complete a drainage study of the city.
Wayne	Implement multifaceted storm water management project that includes installation of catch basins designed for improved sediment removal, street sweeping and other programs.

Chapter 2
Use Impairments

"On behalf of Governor John Engler and the MDEQ, I am pleased with the commitment shown by all partners to revitalize the Rouge River. This report provides reasons for great optimism that our efforts will be successful, while offering a realistic assessment."

Russell J. Harding
Director, Michigan Department of Environmental Quality

Storm drain, Lower Rouge River

Introduction

The Great Lakes Water Quality Agreement (GLWQA), an agreement between the United States and Canada, laid out a format for the development of remedial action plans (RAPs) for specified waterways within the Great Lakes Watershed. In order for the Rouge River RAP to comply with this format, the document is required to define the environmental problems that affect the health of the river and its uses. The GLWQA defines 14 "use impairments," which are changes in chemical, physical, or biological integrity of the Great Lakes System. These use impairments have become the template for determining the extent to which the river is degraded and for measuring progress toward its ultimate cleanup.

Once a beneficial use has been restored, it can be "delisted" using the International Joint Commission's (IJC's) criteria. A table detailing IJC's criteria for listing and delisting uses in Areas of Concern (AOCs) can be found in the *1994 Rouge River RAP Update* or can be obtained from the IJC by calling 313-226-2170. Once all uses have been restored and delisted, the entire AOC can then be delisted.

The MDEQ has determined that ten uses are impaired throughout most of the watershed and three uses require additional study. Refer to Table 4 for a detailed listing of uses that are impaired or need further study in the Rouge River Watershed. MDEQ has decided that the use impairments *added cost to agriculture or industry* and *degradation of phytoplankton and zooplankton populations* are not impaired. In addition, the impairment *restrictions on drinking water consumption or taste and odor problems* are not discussed in this document because the Rouge River is not used as a source of drinking water.

The remainder of this chapter describes the impaired uses of the Rouge River and any progress made toward restoration since 1994. The use impairments are presented in rank order of importance to restoring the River, as determined by the MDEQ and RRAC in 1994.

Table 4
Summary of Impaired Uses, Rouge River Watershed, 1998

Impairment (in Rank Order)	Degree and Geographic Extent*	Probable and/or Known Causes
Restrictions on swimming and other water-related activities RANK 1	Severely impaired - all branches. Middle-2 impaired only after rain events.	Bacteria from combined/separate sewer overflows, nonpoint source pollution, point source storm water discharges, illegal discharges. Unstable stream banks, excessive flow variation.
Loss of fish and wildlife habitat RANK 2	Moderately to severely impaired - all branches and tributaries. Excellent habitat in two headwaters areas.	Physical alteration of habitats (channelization, enclosure or relocation of the streambed) and elimination of streambank vegetation and woody debris in the stream channel. Nonpoint source pollution, point source pollution and combined/ separate sewer overflows. Contaminated sediments, stream flow and illegal discharges.
Degradation of fish populations RANK 3	Severely impaired - further study needed to determine the entire extent of the impairment. Main-1, Main-2, Tarabusi and Tonquish creeks are not impaired.	Nonpoint source pollution, point source storm water discharges, combined/separate sewer overflows, contaminated sediments, stream flow, illegal discharges, point source discharges.

Table 4
Summary of Impaired Uses, Rouge River Watershed, 1998

Impairment (in Rank Order)	Degree and Geographic Extent*	Probable and/or Known Causes
Degradation of benthos RANK 3	Impaired - fair to poor rating (per GLEAS 51) in all branches and tributaries studied.	Nonpoint source pollution, point source storm water discharges, combined/separate sewer overflows, contaminated sediments, stream flow and illegal discharges.
Degradation of wildlife populations RANK 3	Impairment unknown - additional studies necessary.	Loss of habitat, unknown.
Eutrophication or growth of undesirable algae RANK 4	Severely impaired - all branches except most headwaters areas.	Nonpoint source pollution, point source storm water discharges, and combined/ separate sewer overflows.
Degradation of aesthetics RANK 4	Moderately to severely impaired - all branches except most headwaters areas.	Nonpoint source pollution, point source storm water discharges, combined/separate sewer overflows, stream flow and illegal discharges.
Restrictions on fish consumption RANK 5	Severely impaired - Middle Branch downstream of Phoenix Lake and Main Branch downstream of Ford Road and the Lower Branch in Wayne County. Other areas not impaired.	PCBs and mercury from contaminated sediments, point source storm water discharges, nonpoint source pollution and combined/separate sewer overflows.
Bird or animal deformities or reproductive problems RANK 6	Impairment unknown - further study needed to determine the degree and extent.	Unknown.
Restrictions on dredging activities RANK 7	Severely impaired - mouth and Middle Rouge impoundments. Further study needed to determine impairment status in other areas.	Hazardous substances, including PCBs and heavy metals from contaminated sediments, combined/separate sewer overflows and point source discharges.
Fish tumors or other deformities RANK 8	Moderately impaired - further study needed to determine the degree and extent of impairment.	Nonpoint source pollution, point source storm water discharges, combined/separate sewer overflows, contaminated sediments and illegal discharges.
Tainting of fish and wildlife flavor RANK 9	Impairment unknown - additional studies are needed to determine the degree and extent of impairment.	Unknown.
Restrictions to navigation RANK 10	Moderately to severely impaired - all subwatersheds Upper-1, and Middle-1. Need data for Upper-2.	Erratic stream flows, bank erosion, sediment loadings from off-land and streambank erosion.

*See Figure 3 for a map of subwatershed locations.

Restrictions on Swimming and Other Water-related Activities

Rank 1

Recreational use is currently restricted in all branches of the Rouge River. Portions of the Middle Rouge River (from Newburgh Lake downstream to the Nankin Lake dam) will be reopened for recreational use during dry weather in spring 1999. Use restrictions are due to bacterial levels that are not safe for either full- or partial-body contact. There has been a standing health advisory for the entire watershed for total body contact for many years.

The following activities have been carried out to work toward eliminating restrictions on swimming and other water-related activities:

- Bacteria samples have been collected throughout the watershed to determine if levels of bacteria are safe for full- or partial-body contact recreation **(Recommendation I-1a)**.
- Wayne County has targeted the portion of the Middle Rouge River downstream of Newburgh Lake for aggressive illicit connection investigation as part of its efforts to restore recreational uses such as canoeing to this section of the river **(Recommendation I-1)**.
- See activities listed in Chapter 3 under the sections for combined sewer overflows, separate sewer overflows, nonpoint source pollution (especially the on-site sewage disposal subsection), point source storm sewer discharges, and illegal dumping or discharges.

Loss of Fish and Wildlife Habitat

Rank 2

Fish and wildlife habitat is impaired in all branches and tributaries of the Rouge River. Pressure from ever-increasing urbanization is destroying critical fish and wildlife habitats. Most of the land area in the Rouge River Watershed has been developed for human use, and the few remaining undeveloped areas are fast disappearing. As habitat continues to vanish, populations of fish and wildlife will continue to decline. Fish and wildlife habitat is also lost when pollutants degrade habitats; when alterations are made to streambanks (such as vegetation being removed); and when all woody material is removed from the banks of the stream channel and the associated uplands.

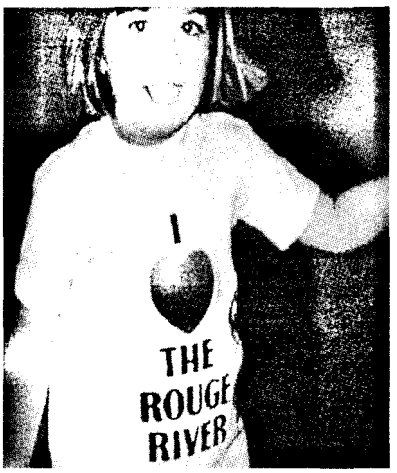
New development in the Rouge River headwaters

The following activities have been carried out to address loss of fish and wildlife habitat. It should be noted that despite these efforts, habitat continues to be lost at an alarming rate.

- A Michigan Water Environment Association conference entitled "Practical and Cost Effective Watershed Management," co-sponsored by the RRAC Habitat Subcommittee, was held on May 2, 1996. The conference had several different sessions regarding habitat protection and enhancement **(Recommendations II-1c, II-2j)**.
- Two seminars to help educate developers and consultants about the importance of preserving valuable fish and wildlife habitats were held by the RRAC Headwaters Subcommittee. Presenters discussed cost effective ways to protect wildlife habitat **(Recommendations II-1c)**.

- The FOTR has established an adopt-a-stream program entitled *RiverWatch* to teach interested parties how to protect and enhance of the River. The program includes a number of activities that groups may choose to accomplish. So far, three groups have pledged to adopt a portion of the river **(Recommendations II-2b, II-2h)**.
- The FOTR Wildlife Habitat Inventory was conducted from March to May 1998. The nearly 150 volunteers inventoried four species of frogs and toads as an indicator of wildlife habitat quality in a 60-square mile area in Northville, Novi, and Salem as well as Plymouth, Walled Lake, and Northville townships. Frogs and toads are good indicators of local habitat health. Results are now being compiled. Final results are not yet available, but early data show that the four indicator species were present, which is a good sign. The northern spring peeper was most frequently observed, closely followed by the western chorus frog. There were substantially fewer reports of American toads and wood frogs. By using volunteer citizens, this project also served to increase public awareness about the river and its quality as an aquatic ecosystem. The scope of the survey will be expanded in 1999 to include more species and one additional subwatershed **(Recommendations II-2c, II-2f, II-2j, II-2o, II-2q, V-1a).**
- The RRAC-Habitat/Headwaters Subcommittee established a "Habitat Protection and Enhancement Honor Roll" and honored the Ford Motor Company Sheldon Road Plant and the Western Wayne County Conservation Association (WWCCA) in December of 1997. The Sheldon Road Plant was honored for a 13-acre wildlife sanctuary created at the site by the UAW, Wildlife Habitat Council, and Ford Motor Company. WWCCA assisted the MDNR with a project to improve the stretch of Johnson Creek that runs through their property and planted trout there from 1993 to 1995 **(Recommendation II-1c).**
- The Southeast Michigan Land Conservancy has been working to purchase parcels of land (as well as conservation easements) within the watershed to protect them from development. In Rouge Watershed communities, the Conservancy has protected the following:
  - 20 acres in Livonia, with ½ mile of frontage along Bell Creek,
  - 40 acres in Westland, adjacent to Holliday Preserve, featuring ¼ mile of Deer Creek which flows into Tonquish Creek, and
  - 729 acres in Superior Township, including a 360 acre farm along Fowler Creek, two nature preserves totaling 331 acres, and the 30 acre *Springhill Nature Preserve,* which protects a spring-fed headwaters marsh.
- This nonprofit group is also educating local governments about the importance of preserving open space for wildlife habitat **(Recommendations II-2j, II-2)**.
- SEMCOG has provided maps to high-growth headwater communities to assist government officials in protecting local natural resources such as wetlands. The maps also show other natural features, such as natural cover, hydrology, current and future impervious cover, 1995 land use, community master plans, and presettlement land cover, to assist in future planning efforts **(Recommendation II-2g, Goal II-4).**
- Wayne County analyzed 1995 land use cover in the watershed to determine the acreage of woodlands, meadows, and wetlands in the watershed, as well as the river miles buffered with vegetation. Researchers found that the watershed is comprised of 4% woodlands, 4% wetlands, and 12% meadows. Forty-two percent of the river miles were buffered with vegetation **(Goal II-2).**

Ford Motor Company has conducted the following efforts to preserve and restore habitat on its land. At the Sheldon Road plant, Ford has restored 9 acres of prairie habitat and will maintain it using prescribed burning, established a nest box monitoring program, and plans to install an interpretive trail representing a variety of microhabitats. At its Research and Engineering Center, Ford has implemented several valuable habitat projects. Among these projects are the restoration of 1.5 acres of prairie, evaluation of a no-mow program



Everyone benefits from a clean river

for up to 100 acres at the Dearborn Proving Grounds (to create avian grassland habitat), piloted native planting techniques as alternatives to traditional landscaping to identify potential reductions in chemical applications and irrigation. Future plans include the establishment of a nest box monitoring program in 1999 **(Goal II-4)**.

- U of M-D's Rouge River Bird Observatory (RRBO) monitors the habitat requirements of nesting scarlet tanagers for Project Tanager, sponsored by the Cornell Lab of Ornithology and will assist with Cornell's pilot project on the effects of forest fragmentation on thrushes **(Recommendation II-2c)**.
- Superior Township and the Southeast Michigan Land Conservancy are promoting conservation easements along Fowler Creek in the Lower Rouge River subwatershed. Funding for the promotional and educational aspects of this $20,000 project is being provided by the Rouge Project. The project has identified potential conservation easement sites adjacent to the Rouge River. The project will demonstrate how a strategy of pollution prevention using conservation easements can be cost effective and translate into desirable and beneficial land uses in the watershed and along the river corridor **(Recommendations II-2a, II-2k)**.
- The Washtenaw County Drain Office Storm Water Conveyance and Wetland Treatment Project has conducted an in-depth field investigation in Salem Township to determine the feasibility of replacing piped storm water conveyance systems with open swales and treatment using constructed wetlands **(Goal II-4)**.
- MDNR-Fisheries is considering a proposal to redesignate Johnson Creek/Drain as a second-quality coldwater stream **(Goal II-2)**.
- The Holliday Nature Preserve Association (HNPA) just celebrated its 10-year anniversary. The group has conducted 10 Rouge Rescues, many Earth Day cleanups, tree plantings, nature tours, and has adopted the Tonquish Creek as part of the FOTR RiverWatch program. In addition, the group comments to governmental agencies about environmental concerns that potentially affect the preserve **(Recommendation II-2b)**.
- HNPA, FOTR, MDEQ-SWQD, and local residents are trying to save habitat at the Koppernick Corporate Park development in Canton by discussing habitat issues with local governmental officials and the developer **(Recommendation II-1e)**.
- Salem and Superior Townships have adopted a wetland ordinance and Salem Township is developing a woodland ordinance to protect existing natural resources in this rural area **(Goal II-2)**.
- The Bell Branch and Tarabusi Creek Subwatershed Study included recommendations that, during site plan review, local governments require storm water management to minimize the impact of development. The report further recommends that channel restoration and stabilization measures be implemented along with storm water detention and flow control projects **(Recommendations II-1d, II-3c, II-4c)**.
- The Canton Township Enviro-friendly Golf Course Design will demonstrate comprehensive management of storm water runoff and will incorporate BMPs for turf management such as native prairie and wildflower buffer strips and natural habitat preservation. A design manual will be created to guide planning, construction, and maintenance **(Recommendation II-2d)**.
- In its Lower Rouge Branch Report, the Rouge Project summarized river conditions and made recommendations for future action. These recommendations included study of amphibian habitat in the Lower Rouge and development of a wetlands banking strategy **(Recommendations II-1d, II-3c, II-4c)**.
- MDEQ's procedures for wetland banking went into effect on December 31, 1997. Wayne County has submitted the first application for a bank, including approximately 40 acres of wetlands in a number of county park sites **(Recommendation II-1d)**.
- Friends of the Tarabusi in Livonia have adopted a portion of the Tarabusi Creek. They held two independent cleanups in 1997 and participated with Livonia in the 1998 Rouge Rescue. Livonia has provided critical support for all cleanups **(Recommendation II-2b).**
- The RRAC-Habitat/Headwaters Subcommittee is providing a wetlands information packet to 14 headwaters communities in 1998. The packet includes a map of wetlands within the community, model wetland ordinances for communities and other educational material **(Recommendation II-2j)**.

- Wayne County Parks and Recreation has been working with developers to preserve and enhance habitat as part of their projects. For example, a developer created a wetland in the Northville area of the Middle Rouge Parkway to treat the storm water runoff from the site **(Recommendation II-1e)**.
- NRCS and the Wayne and Washtenaw county conservation districts conducted a fall and spring tree sale, selling over 200,000 seedlings in both counties **(Recommendation II-1)**.
- Wayne County Parks used a geo-web wall with plantings to stabilize the streambank alongside a new bikeway **(Recommendation II-2d)**.
- The Salem Township Johnson Creek Habitat Assessment and Education Project plans to survey Johnson Creek, a headwater tributary of the Rouge, and has begun to create public awareness about the quality of this coldwater stream **(Recommendation II-2d)**.

See nonpoint source pollution, storm water discharges, combined sewer overflows, contaminated sediments, erratic stream flow, permitted industrial and municipal discharges, destruction of habitat, and illegal dumping and discharges sections in Chapter 3 for more progress being made to address this use impairment.

Degradation of Fish Populations

Rank 3

Fish populations are degraded in all branches of the Rouge River except some stretches of the more pristine headwater streams. Fish populations are considered degraded when their numbers are below that which is expected for a given habitat. Even at its best, the Rouge River only supported a few gamefish because of the area's geology. Only a small portion of the river's flow is groundwater. Most of the river is composed of warmer, less reliable storm water runoff, which does not provide adequate baseflow. If habitat in the Rouge River were not degraded, however, a more abundant and diverse population of warmwater fish species would live there, as well as a greater number of intolerant species such as brown trout.

MDNR fish survey

Sources of pollution such as soil erosion from construction sites, CSO and storm water discharges, increased stream flows from impervious surfaces (such as asphalt and concrete), illegal spills, and contaminated sediments all contribute to the degradation of fish populations. These pollutants can increase water temperatures and create deposits on the stream bottoms that cover valuable habitat and clog fish gills. Discharges of organic nutrients from CSOs and illegal discharges can use up precious oxygen that may already be low, which in turn suffocates the fish. Excessive and rapid fluctuations in stream flow can create extremes in water temperature and increase streambank erosion. Minimizing flow fluctuations by adequately controlling new and existing storm water discharges to the stream is critical for the survival of fish populations.

The following activities have been carried out to address degradation of fish populations:

- A Fisheries Watershed Assessment was completed in 1997 by the MDNR for the Rouge River Watershed with funding from the Rouge Project. The study profiled the river and its fish populations. Researchers found that many factors negatively affect fisheries such as excessive flow instability, degraded water quality due to input of sewage and storm water, sedimentation from erosion and storm water flows, and fragmentation due to dams, paving of the stream channel, and habitat destruction.

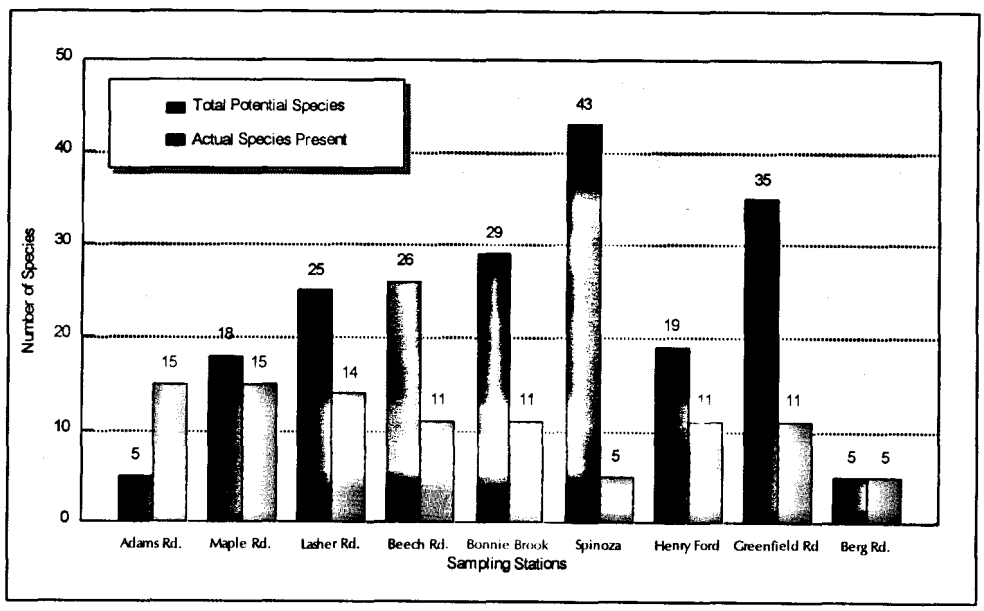
  Although the geology of the watershed does not lend itself to stable hydrology, the study concluded that this tendency is greatly amplified by increased storm water runoff caused by urbanization and development.

Urbanization results in a high percentage of impervious surfaces (such as rooftops and roadways) that increase the velocity and magnitude of flood peaks and diminishes the river's base flows. This effect is magnified in the lower reaches of the river, where development is now most dense and where wetlands had historically offered storm water retention. In addition, over 60 dams and four miles of paving have reduced the ability of fish from the Great Lakes to migrate up the river to spawn.

In 1995, researchers identified 53 species of fish in the Rouge River, similar to those found in 1986. The greatest gamefish populations were found in the impoundments. Newburgh Lake, in particular, provides an accessible fishery for typical lake species such as largemouth bass, northern pike, bluegill, pumpkinseed, and black crappie. Historically, contaminated sediments have made consumption of many of these fish unsafe; however, remediation of Newburgh Lake sediments is expected to eliminate the fish consumption advisory for this heavily used lake impoundment. In the remainder of the watershed, most fish species were indicative of flashy, warmwater streams.

The assessment suggests many management options for the river. The ideas are too numerous to describe here, but include further studies of aquatic life, rehabilitation of habitat and wetlands, removal of dams, flow augmentation in low baseflow areas, rehabilitation of the stream channel shape, protection of groundwater recharge areas, providing additional vegetative buffers along the stream, and taking action to improve water quality **(Recommendation III-1a)**.

Figure 4: Potential Target Fish Species vs. Actual Species Present in the Main Rouge River



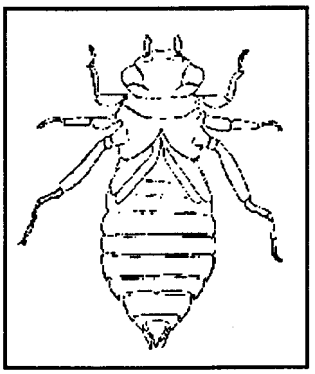
University of Michigan researchers conducted a study of the fisheries potential of the river with funding from the Rouge Project. The results of the study found that the downstream, larger reaches of the Rouge River have the greatest potential for developing recreational sport fisheries. Fisheries in these areas are, however, currently severely degraded by poor water quality. Fish communities in the headwater streams of the Rouge are in relatively good condition, supporting fisheries similar to non-urbanized streams in southern Michigan. The recently augmented flow of the Lower Branch of the Rouge River has greatly enhanced its potential as a fishery. The river exhibits typical effects of urban development, which include high flows during storm events and low flows at other times. Most of the river has flows two to three times greater during storms than would provide optimal habitat for the targeted game fish species. Researchers state that watershed-wide reductions in storm water runoff will likely be necessary to rehabilitate fish communities **(Recommendation III-1a)**.

MDNR-Fisheries Division stocked 19,393 brown trout in Johnson Drain in 1996 to try to establish a fishery in that area **(Recommendation III-1f)**.

Degradation of Benthos

Rank 3

Benthos are bottom dwelling organisms, such as aquatic insects, that live in the river for at least part of their life cycle. Because they are sensitive to physical and chemical changes in their habitat (including decreased oxygen levels) and cannot easily escape pollution as some fish can, they are useful indicators of a river's water quality. Benthic macroinvertebrates are those benthos that can be seen with the human eye, such as dragonfly nymphs.



Dragonfly nymph

Benthos are considered to be impaired in many portions of the Rouge River Watershed. In the Rouge River, benthos populations are degraded by streambank erosion, storm water runoff, CSO, industrial and municipal discharges, contaminated sediments, erratic stream flow and illegal discharges.

The following activities have been carried out to address degradation of benthic populations:

- With grant monies from the Rouge Project and local matching funds, the following streambank stabilization projects are underway to reduce the severe erosion that occurs in the Rouge River. The projects are using natural planting as well as rock reinforcements to provide habitat value to the project **(Recommendations IV-1c, II-1, II-2d)**.
  - The Oakland County Drain Commissioner is designing a $40,000 energy dissipation system downstream of the Edwards Relief Drain to help reduce erosion.
  - Farmington Hills completed a $60,000 study to analyze existing erosion controls at construction sites and evaluate local ordinances to see if revisions are needed to provide better protection of the river.
  - Novi is implementing a $36,500 project using a biodegradable erosion control blanket to reduce erosion from construction sites upstream of Northville Mill Pond.
  - The Oakland County Drain Commissioner is targeting 2,500 feet of the Caddell Drain for its $150,000 streambank stabilization project. Stabilization methods will include rock, boulder, and erosion control blankets.

Students participating in the Rouge Education Project

- In April of 1997, FOTR used contributions from several watershed communities to fund a streambank stabilization project on a 200-foot section of the Rouge River in Eliza Howell Park. A bioengineering approach used live plant materials to provide bank stability. The NRCS provided technical input for this project and held a workshop on bioengineering techniques for more than 30 participants from local governments, county and state agencies, and area environmental engineering firms **(Recommendation IV-1c)**.
- Dearborn hosted a streambank stabilization workshop in November 1998. This workshop helped train participants in the techniques associated with natural plantings for streambank stabilization. Citizen and other volunteers did the actual stabilization work.
- Detroit Recreation Department is developing a $270,000 environmentally friendly parks maintenance program that highlights use of native vegetation, soil bioengineering techniques for streambank stabilization, an environmentally friendly gardening project, and wetlands or swale construction **(Recommendation IV-1c)**.
- HNPA secured logs in the streambed to provide riffles as part of its Rouge Rescue effort from 1996-1998 **(Recommendation IV-1d)**.

- Wayne County Parks and Recreation will utilize natural erosion control measures and dredging to open race channels that will control flooding and improve water quality. The $200,000 study and design will be coordinated with strategic planting and landscaping to assist in the overall streambank stabilization **(Recommendation IV-1c)**.
- Located in the heart of the city, the Northville Mill Pond has accumulated sediment that limits its recreational use. Northville, with the help of the Northville Historical Society, Northville Public Schools, and the Friends of the Mill Pond, will analyze current conditions at the pond and develop a restoration plan at a cost of $200,000 **(Recommendation IV-1c)**.
- Detroit and the NRCS will implement a $95,000 bioengineering project to stabilize the eroding banks of Rogell Drain **(Recommendation IV-1c)**.
- Wayne will conduct a stream bank erosion inventory of the entire section of the Lower Rouge River that runs through the city **(Recommendation IV-1c)**.
- The Novi Streambank Stabilization Project will use multiple bioengineering techniques on designated streambanks to mitigate and reduce the amount of eroding sediments being generated from existing natural streambanks of the Rouge River while maintaining the natural aesthetics and character of the river. The results of the project will be useful to other communities who wish to implement similar techniques **(Recommendation IV-1c)**.
- Novi will also utilize $90,000 in alternative bank stabilization techniques upstream of the Northville Mill Pond, which will further enhance the Mill Pond restoration effort **(Recommendation IV-1c)**.
- The Washtenaw County Drain Commissioner will restore and protect Johnson Creek, a high quality cold water stream, while incorporating $62,000 in streambank stabilization techniques (different than those used the Novi project described above). Protecting habitat in this creek is especially important since the redside dace, a threatened species of minnow, has been found there. Selection, costs, and installation procedures for the various stabilization techniques will be summarized in a report and the installation process, conducted by volunteer teams, will be videotaped as a demonstration tool to be shared **(Recommendation IV-1c)**.
- In 1996, the Rouge Project conducted a $35,500 aquatic habitat survey (of both macroinvertebrates and algae) of over 80 sites throughout the watershed. Researchers assessed biological health in different areas in the watershed and developed criteria to select habitat restoration sites **(Recommendation IV-1)**.

Degradation of Wildlife Populations

Rank 3

Wildlife in the Rouge

No studies have been conducted to determine if wildlife populations have been degraded, therefore the status of this impairment is considered to be unknown. Widespread degradation is suspected, however, largely due to the loss of fish and wildlife habitat and generally poor water quality. Contaminants can be transferred to animal populations when they drink river water or eat contaminated fish or plants from the river. Contaminants can become concentrated (or bioaccumulate) in animal tissue and cause disease as well as genetic mutations in wildlife offspring. Degradation of wildlife populations can significantly change the balance of the entire ecosystem. Destruction of wildlife habitat also has a significant impact on wildlife populations and is discussed in further detail under the section entitled "Loss of Fish and Wildlife Habitat."

The following activities have been carried out to address degradation of wildlife populations:

- The U of M-D's RRBO studies the importance of urban natural areas, especially as migratory stopover sites. RRBO projects include banding of over 127 species of birds; surveys of migratory birds, nesting species, and winter populations; cooperative research projects; and public education **(Recommendations V-1a, K1l)**.

- The University of Michigan - Dearborn's RRBO works with the Farmington Area Naturalists, Farmington Hills, and Ford Motor Company's Sheldon Road Plant tracking eastern bluebirds that nest on their properties **(Recommendation V-1a)**.
- RRBO and the RRAC - Habitat Subcommittee participated in a Marsh Monitoring Project, sponsored by the Canadian Wildlife Service and Long Point Bird Observatory. The project was designed to assess the diversity and abundance of marsh birds in Great Lakes AOCs **(Recommendation V-1a)**.
- RRAC Habitat/Headwaters committee members and the Southeast Michigan Group of the Sierra Club provided input to Wayne County's Wetland Mitigation Bank program **(Recommendation V-1f)**.
- See the "Loss of Fish and Wildlife Habitat" section of this chapter for a description of the FOTR Wildlife Habitat Inventory.

Eutrophication or Growth of Undesirable Algae

Rank 4

Eutrophication or undesirable algae can be found in all branches of the Rouge River. It is most prevalent in the impoundments and less evident in the headwaters areas. Eutrophication is a natural process that all water bodies experience over geologic periods of time (hundreds of years). Symptoms of eutrophication include an increase in plant growth, periods of low dissolved oxygen concentrations and stagnant water.

Although eutrophication is a natural process, human activities can significantly accelerate it by adding excessive nutrients to a water body. This type of eutrophication is called cultural eutrophication. Examples of nutrient sources of human origin include lawn fertilizers and wastewater from leaking septic systems. These nutrient sources encourage excessive algae growth that can deplete oxygen levels and cause fish kills.

The following activities have been carried out to address eutrophication issues:

- The Rouge Project established an extensive sampling network to monitor phosphorus and other nutrients to locate problem areas and determine what nutrient targets should be set for the river. Data collected in 1994 and 1995 indicate that Walled Lake, Meadowbrook Lake, Phoenix Lake, and Newburgh Lake are all somewhat to highly eutrophic. Based on limited historical data, researchers have concluded that algae and nutrient concentrations in the impoundments have not changed substantially in the last 20 years **(Recommendation VI-1b)**.
- As part of the Rouge Friendly Neighborhood Program, Wayne County, FOTR, and Southeastern Oakland County Resource Recovery Authority (SOCRRA) are working with individuals and groups to educate homeowners about the impact of lawn fertilizers on the river and to promote the wise and discriminating use of fertilizers **(Recommendation VI-1c)**.
- Northville Township encourages the use of low phosphorus fertilizer in deed restrictions for subdivisions **(Recommendation VI-1c)**.
- SOCRRA and the Rouge Project conduct Healthy Lawn and Garden Rouge Friendly workshops for homeowners to promote composting and reduced fertilizer use.

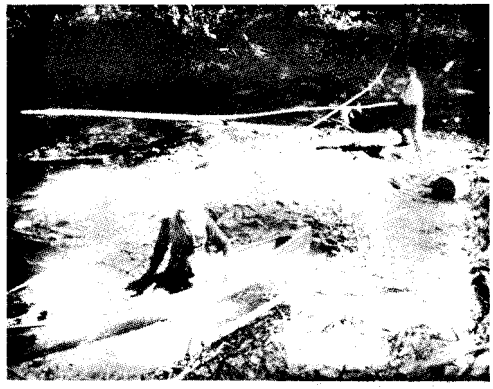
Degradation of Aesthetics

Rank 4

The aesthetic value, or appearance, of the Rouge River is degraded by large logjams, unnatural color from wastewater discharges, turbidity or cloudiness, solid waste or garbage, oil, and unnatural odors. The river is considered to be impaired for aesthetic value in all branches, except some headwaters areas.

The following activities have been carried out to address the degradation of aesthetics:

- The FOTR has sponsored the annual Rouge Rescue for thirteen years. During this event, volunteers remove garbage and obstructive logjams that contribute to streambank erosion. In recent years, activities have been expanded to include nature trail construction, habitat enhancement, and streambank stabilization activities **(Recommendation VII-1a)**.
- Wayne County removed three significant logjams along the Lower Rouge River in the Inkster area in 1997 that occurred after a large storm. In 1996, Wayne County removed a number of smaller logjams along the Middle Rouge River **(Recommendation VII-1a)**.
- In conjunction with its baseline water quality sampling efforts, the Rouge Project recorded information about the river's water clarity, color, odor, and visible debris. In general, headwaters areas exhibited excellent to good conditions, declining to fair conditions downstream. The lowest quality aesthetics were found near the mouth of the Rouge River, where poor conditions were found **(Recommendation VII-1)**.



Rouge Rescue logjam

- As part of the Rouge River Reconnaissance Survey, the Rouge Project surveyed all outfalls in over 90 miles of the Rouge River system. Suspected contamination was recorded. A total of 630 outfalls were observed including 111 storm sewer outfalls, 108 combined sewer outfalls, and 411 outfalls that were not identified on local maps. The sources and suspected contamination of the unidentified outfalls will be investigated as a follow up to this survey **(Recommendation VII-1b)**.

Restrictions on Fish Consumption

Rank 5

Fish consumption advisories have been issued by the Michigan Department of Community Health (MDCH) for all fish within the Rouge River Watershed, with no consumption advised in some areas for carp, catfish, suckers, bass, and northern pike. Elevated levels of polychlorinated biphenyls (PCBs) in these fish have caused fish consumption to be restricted in the Main, Upper, Middle, and Lower branches of the river. In addition, mercury is restricted in all inland lakes and impoundments in Michigan. Figure 5 shows the portions of the Rouge River that are presently under these fish consumption advisories and which fish species are restricted. If people eat contaminated fish in excess of amounts recommended, they may experience negative health effects.

Figure 5: Proper Fish Preparation

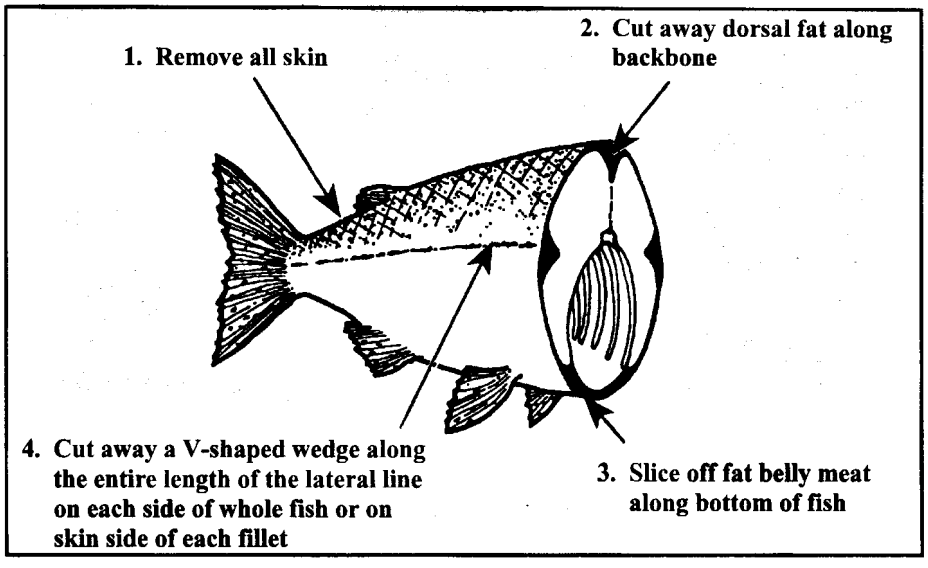


Figure 6: Rouge River Watershed Fish Consumption Advisories

Michigan's fish consumption advisories are two-tiered. There is one advisory for the general population and another for women and children. The "general population" category is for men, boys over the age of 15 and women who are beyond childbearing years. The "women and children" category is for women who are pregnant or breastfeeding, women who intend to have children, girls over the age of 15 and all children under the age of 15.

• • • **Main and Upper branches above M-153/Ford Road:**
General population: Unlimited consumption
Women and children: Limit consumption of white sucker to one meal per week

○ **Pheonix Reservoir:**
General population: Unlimited consumption
Women and children: Limit consumption of bluegill to one meal per week and carp to one meal per month

▬ **Middle branch below Phoenix Reservoir and Main branch below M-153/Ford Road:**
General population: Do not eat the following fish: carp, catfish, sucker, largemouth and smallmouth bass, and northern pike
Women and children: Do not eat any fish

• • • **Lower branch:**
General population and women and children: Do not eat carp or suckers

General Advice:

- No one should eat more than one meal a week of fish of the following kinds and sizes from any of Michigan's inland lakes and reservoirs: 1) Rock bass, yellow perch or crappie over 9 inches in length and 2) bass, walleye, northern pike, or muskie of any size.
- Women and children should not eat more than one meal a month of these fish.

This advisory was updated in January 1998. For the most up-to-date advice, contact the MDCH at 1-800-848-6942.

For several years, Michigan and the federal government were at odds regarding Michigan's fish consumption advisories. The Michigan Environmental Science Board (MESB) offered recommendations in 1995 that Governor John Engler subsequently asked the board to review in light of additional research findings in late 1996. In January 1997, the MESB again recommended the original proposal for a two-tier process for developing fish consumption advisories. The procedure uses one method to develop advisories for adult males and women beyond childbearing years and another, more stringent, approach for women of childbearing age and children under 15 years of age.

The following activities have been carried out to work toward the elimination of local fish consumption advisories:

- In January 1998, MDCH published a user-friendly booklet entitled *Michigan Fish Advisory, Important Facts to Know if you Eat Michigan Fish* that incorporates updated fish consumption advisory information and a hotline for the most up-to-date advice (1-800-648-6942). Information is also available through the Internet at the following address: *http://www.mdch.state.mi.us/pha/fish/index.htm.* See Figure 6 for an updated map of fish consumption advisories in the watershed **(Recommendation VIII-1c).**
- The Rouge Project and the MDEQ conducted extensive sediment sampling in the Middle Rouge to find sources of PCB and other contaminants. The MDEQ found that at least one source of PCBs in Newburgh Lake originated upstream from a historical release at the Plymouth Industrial Center, Incorporated property (formerly Evans Assets Holding Company). The MDEQ remediated this area in 1996 and removed all the PCB contamination **(Recommendation VIII-1a).**
- The greatest fish contamination in the watershed was found in Newburgh Lake, an impoundment of the Middle Rouge. This contamination was mainly caused by historical releases of PCBs. The Rouge Project has eradicated the contaminated fish and removed the contaminated sediments from Newburgh Lake. The lake bottom has been recontoured and native or naturalized plants have been planted along the shoreline to create better fish and wildlife habitat. Restocking the lake began in October 1998 and will continue for the next 3 years **(Recommendations VIII-1b, II-2d).**

Newburgh Lake Restoration Project

- The MDEQ-SWQD conducted caged fish studies on the main stem of the Rouge River in 1995 to study bioaccumulative contaminants and sources, in particular the Hubbell-Southfield CSO outfall. Levels of PCBs in fish downstream of the Hubbell-Southfield CSO outfall were twice as high as upstream fish, flagging this discharge as a significant PCB source. Upstream sources, however, were also indicated. The study showed high levels of bioaccumulative contaminants such as PCBs, chlordane, and DDT in the Rouge River relative to other rivers in the state **(Recommendations VIII-1a, B-1f).**

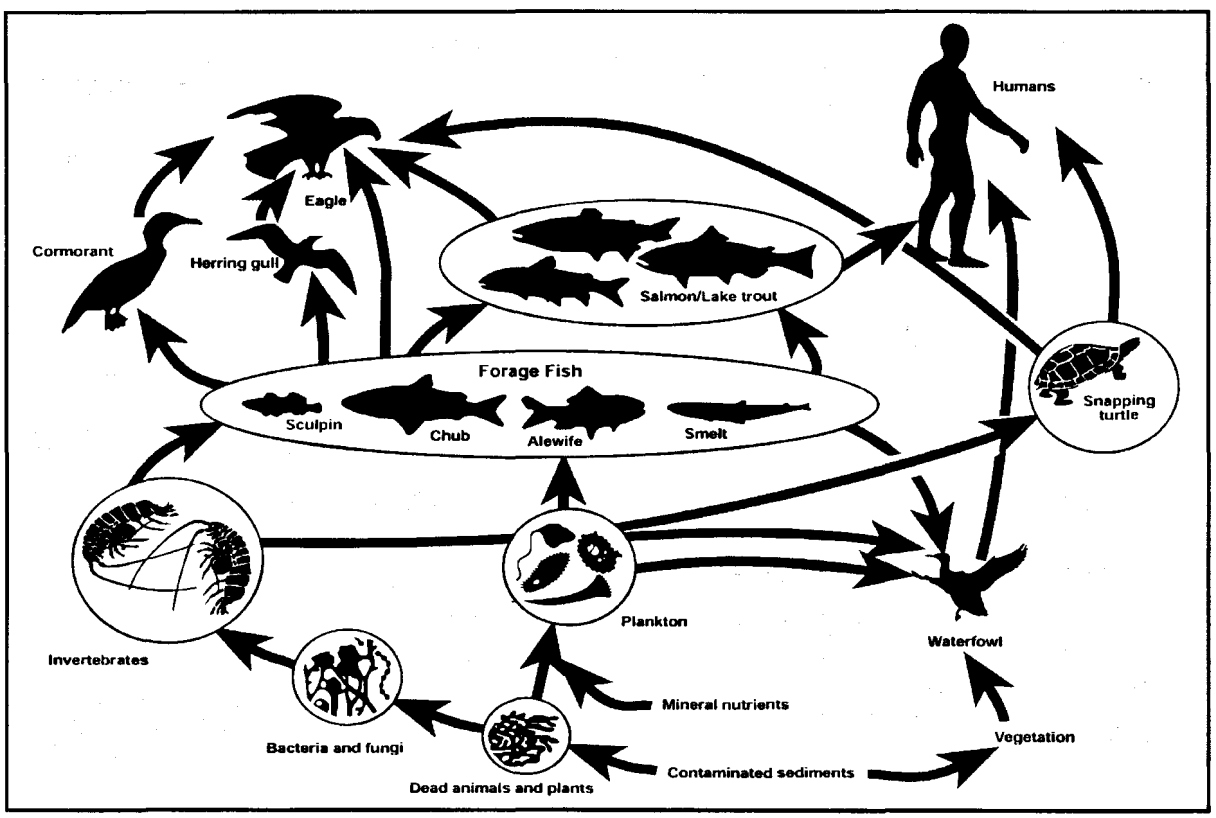
Bird or Animal Deformities or Reproductive Problems

Rank 6

At present, no studies have been conducted to determine if bird and wildlife populations within the Rouge River Watershed have been affected by contaminants. The status of this impairment is therefore considered to be unknown. Deformities can occur in bird and wildlife populations due to the bioaccumulation of environmental pollutants. Contamination of aquatic plants and animals with heavy metals and organic chemicals can cause deformities or genetic changes in future generations.

No progress has been made on this use impairment since 1994.

Figure 7: Great Lakes Food Chain and Bioaccumulation



Restrictions on Dredging Activities

Rank 7

Maintenance dredging at the mouth of the Rouge River is done annually by the United States Army Corps of Engineers (USACE) to allow for shipping traffic. Dredging activities are restricted due to contamination of sediments that limits where the dredged materials may be deposited. Rivers are dredged to remove sediments and debris that can slow the river's flow and impede navigation. A confined disposal facility has been established at Pointe Mouillee for the disposal and required containment of contaminated dredgings from the Rouge and Detroit Rivers.

Local maintenance dredging in other areas of the watershed has not been well regulated. Dredged materials from drain cleaning projects are normally deposited on the adjacent streambanks. These exposed sediments,

which may be contaminated, pose a potential threat to human health and may reintroduce contaminants to the water column. Monitoring or restriction of these types of activities is necessary to prevent further degradation of water quality and reduce human health risks. Dredging activities are restricted in the Middle Branch, impoundments, and the mouth of the Rouge River. Further study is needed to determine the extent of this impairment within the watershed. For further discussion of this topic, see the "Contaminated Sediments" section of Chapter 3.

The following activities have been carried out to address restrictions on dredging activities:

- See the section in this chapter entitled "Restrictions on Fish Consumption" for progress on sediment sampling **(Recommendation X-1a).**
- In 1996, MDEQ-SWQD took surficial sediment samples in the Main Stem of the Rouge River (from the turning basin area downstream to the river's mouth). Various levels of contamination were found. This data was put into the main Southeast Michigan FIELDS Sediments Database kept by the USACE. MDEQ and EPA conducted a fall 1997 sediment survey in this same area utilizing the research vessel *Mudpuppy* **(Recommendation X-1a).**
- Sediments from the Rouge Turning Basin were included in a DEQ and USEPA study of sediment disposal treatment technologies. Preliminary results showed the sediments can be effectively and economically treated and used for other purposes **(Recommendation X-2a).**
- Detroit was awarded a $50,000 grant from MDEQ to study coal tar deposits off the Detroit Coke site, which is being remediated under Resource Conservation and Recovery Act (RCRA). The study will determine whether contamination from the site extends into the Rouge or Detroit rivers **(Recommendation X-2a).**

Contaminated fish removed from Newburgh Lake

Fish Tumors or Other Deformities

Rank 8

Fish tumors occur due to natural causes, such as viruses or hereditary weaknesses, in approximately one percent of fish populations. Contaminants in the Rouge River are believed to cause fish tumors or other deformities in more than one percent of the total fish community. More studies are needed to determine the geographical extent of this impairment.

- No progress has been made on this impairment since 1994.

Tainting of Fish and Wildlife Flavor

Rank 9

At the present time, no studies or surveys have been conducted to determine if the flavor of fish within the Rouge River Watershed is tainted by waterborne contamination. Contaminants that fish and wildlife consume, however, may be affecting the taste of fish and wildlife flesh.

- No progress has been made on this impairment since 1994.

Restrictions to Navigation

Rank 10

Erosion of soil from streambanks, construction sites, and other sources significantly increases the amount of particles in the streambed and impoundments which, if allowed to accumulate, can impair navigation. Shipping traffic at the mouth of the river would become severely restricted if annual dredging of the channel did not occur. The Army Corps of Engineers maintains the channel so that industries along the Rouge River can receive goods and raw materials that are transported by ship.

Farther inland, however, maintenance dredging is done only to remove flow obstructions that cause flooding. Large logjams and other debris make the river impassable in many places. The annual Rouge Rescue, sponsored by the Friends of the Rouge, helps to remove some of these obstructions only to have others occur the next year. Smaller boats are able to maneuver adequately in the larger impoundments on the Middle Rouge and the channelized portion of the Main Branch.

The following activities were conducted to address restrictions to navigation:

- The FOTR annual Rouge Rescue continued throughout the years 1995-1998. In 1998, 20 sites hosted the river cleanup, where volunteers removed logjams and debris from the river. Some sites also stenciled storm drains, planted trees or shrubs, or took other actions to enhance the river environment **(Recommendation XIII-1a)**.
- The USACE conducts maintenance dredging in the Main Stem of the Rouge River approximately every year to permit navigation. Dredgings are disposed of in the Pointe Mouillee confined disposal facility **(Goal XIII)**.
- See the Degradation of Benthos section of this chapter for activities related to streambank stabilization **(Recommendation XIII-1b)**.
- Also see "Degradation of Aesthetics" (this chapter), and "Stream Flow" (Chapter 3) sections for more progress related to navigation issues.

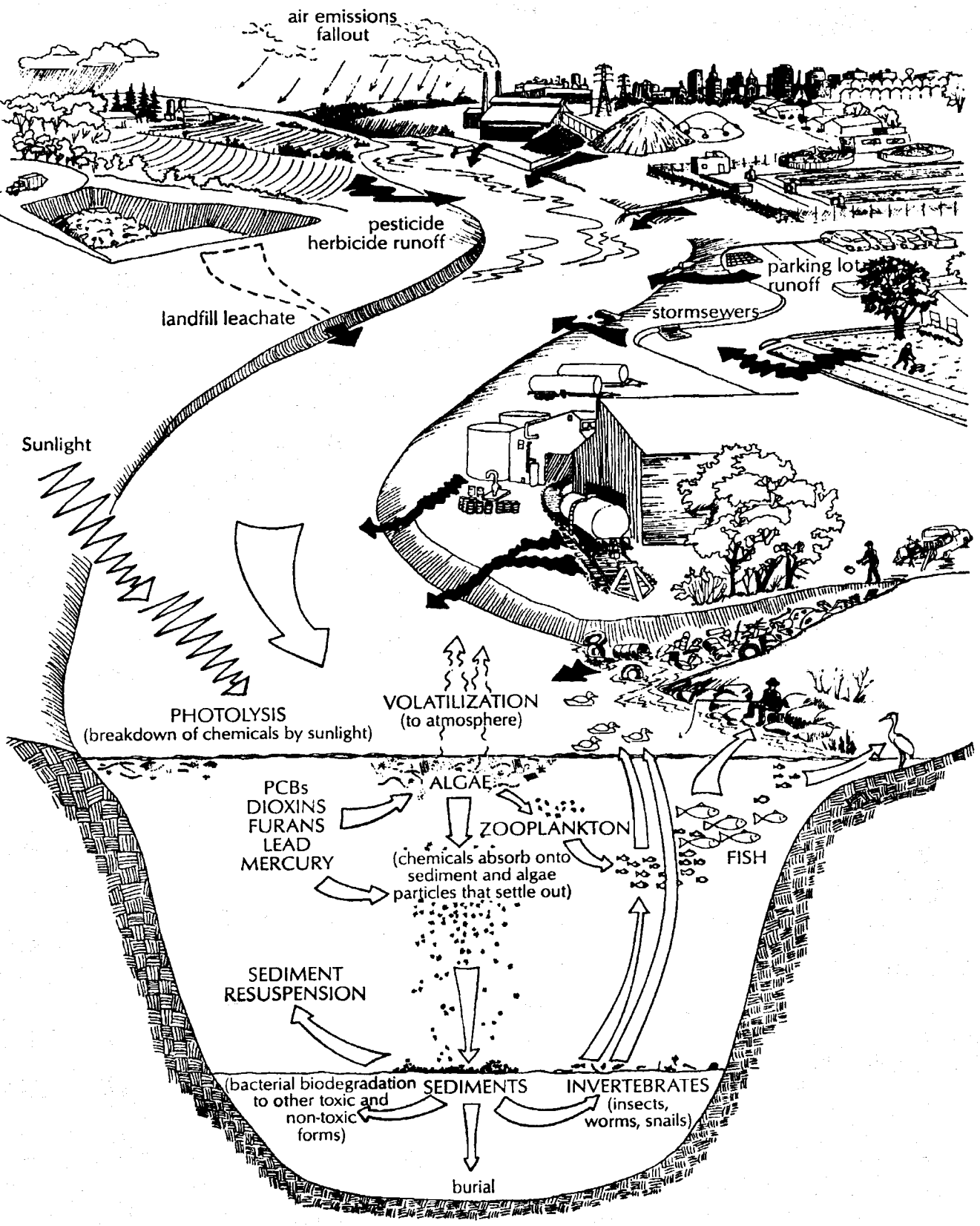
Chapter 3
Sources of Impairment

"We need to recognize that we've made progress in some areas of the Rouge River RAP; but we also need to recognize that we haven't even started to protect the natural habitat and headwaters which ultimately provide us with a healthy river ecosystem. Unfortunately, if we don't act soon it will be too late."

Jack Smiley, President
Southeast Michigan Land Conservancy

Illegal discharge

Figure 8: Sources of Pollution



Introduction

Much progress in cleaning up the Rouge River has been made since the *1994 Rouge River Remedial Action Plan Update* was published. Millions of dollars have been spent to control combined sewer overflow (CSO) discharges in the watershed. Innovative programs are being implemented to protect habitat and address storm water runoff and other nonpoint sources of pollution.

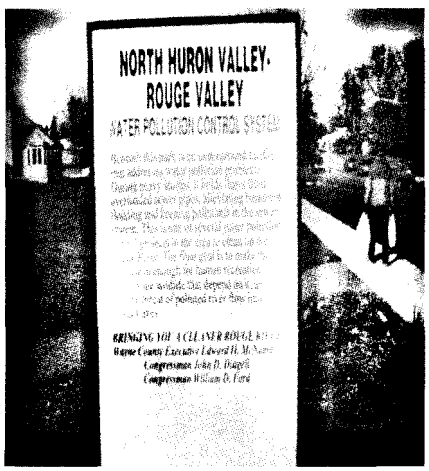
The pollution sources of greatest concern are described in this chapter in order of priority. Note that some sources are of equal importance and therefore have the same numerical ranking. Separate sanitary bypasses and CSOs still rank as the highest priority because of the public health threat associated with them. These sources, however, are currently being addressed. Our focus has now shifted toward implementation of activities to address storm water and nonpoint sources of pollution. Other sources of impairment detailed in this chapter include contaminated sediments, variable stream flows, permitted municipal and industrial point source discharges, storm sewer discharges, and illegal dumping and discharges.

Most sources of pollution cause impairments to one or more designated uses (see Chapter 2). For example, discharges from CSOs as a pollutant source can impair swimming and other water-related recreation, degrade aesthetics, contaminate sediments, and negatively affect fish, wildlife, and benthos populations. Table 4 references the sources of impairment that are responsible for impairing each of the uses listed in Chapter 2.

Separate Sanitary Sewer Overflows

Rank 1

Some areas of the Rouge River Watershed are served by sewers that carry storm water and sanitary wastewater in separate sewer pipes. These types of sewer systems are referred to as "separate sewers." Although the pipes are separate, groundwater can still seep into separate sanitary systems through cracks in the sewer lines. Storm water runoff can also enter through direct connections to the sewers from residential downspout and footing drains, faulty manhole covers and improperly connected catchbasins or drains. As a result, certain wet weather conditions can overburden these systems.



Addressing SSOs

When a sewer system becomes overwhelmed, sewer system operators may discharge sanitary sewage directly into the river to avoid sewage backup into homes and businesses. These discharges (or "bypasses") carry disease-causing organisms that are a risk to public health and nutrients that decrease the amount of oxygen available to aquatic organisms. They are considered illegal discharges and are a violation of Act 451, the Michigan Natural Resources and Environmental Protection Act of 1994, as amended, and the Federal Clean Water Act of 1972. Although there were few separate sewer overflow (SSO) events reported in 1992-1994, a number have been reported in more recent years. Some of these SSOs have been addressed by new sewer projects. Others have occurred in areas that have adequate sewer system capacities, but experienced unusually large storms. Under investigation are SSO events in Bloomfield Hills, Garden City, Livonia, West Bloomfield Township, and Westland.

The following improvements to separate sanitary sewer systems have been implemented to reduce bypasses of raw sewage into the river:

- DWSD has completed the Detroit Flow Management Plan, at a cost of $190 million **(Recommendation A-1a)**.
- Local governments in the Evergreen - Farmington sewer service area have completed a set of local sewer improvements and continue to study the area **(Recommendation A-1b)**.

- Local governments in the North Huron Valley/Rouge Valley sewer service area have completed sewer improvements at a cost of $21.4 million **(Recommendation A-1c).**
- The RRAC-Nonpoint Source (NPS) Subcommittee conducted a community survey regarding downspout connections and their regulation (56% response rate). Survey results indicate that a majority (63%) of the responding communities have a downspout disconnection ordinance and/or program. Of those communities with ordinances, 65% stated that their program is actively implemented. Most (81%) have enforcement mechanisms and 63% actively use them. Only 13%, however, can assess the effectiveness of their ordinance **(Recommendation A-1e)**. Other important information from the survey included the following:
  - Many ordinances do not prohibit downspout connections to separate storm water sewer systems.
  - Compliance is generally ensured through smoke testing, downspout inspections during water readings, and at property sale.
  - Communities overwhelmingly desire increased public education, believing that their citizens do not fully understand the impacts that connected downspouts have on the watershed.
  - Over half (58%) of the communities with ordinances apply the same requirements to both residential and commercial/industrial areas.
- The RRAC-NPS subcommittee designed an informational downspout brochure for the general public. The fold-out brochure explains why it is important to direct downspouts to a vegetated area and not to a sanitary or storm sewer. The brochure is digitally mastered so that communities may add their own symbols and local contact information. Livonia has already mailed the brochure to a targeted area of the city and the Washtenaw County Drain Commissioner has requested a digital copy **(Recommendations A-1e, K-1h).**
- Westland has completed Phase I of their manhole rehabilitation program at a cost of $1 million. Phase II (which will cost an additional $800,000) is underway **(Goal A-1).**

Combined Sewer Overflows

Rank 1

In many of Michigan's older urban areas, storm water, sanitary sewage, and industrial wastewater are all transported to municipal wastewater treatment plants through a common sewer pipe. These combined sewer systems are designed to overflow directly into local rivers when they become overburdened by excessive storm water. Figure 8 depicts how a combined sewer system operates. The overflows are designed to prevent sewage from backing up into homes and businesses.

Figure 9: Combined Sewer System

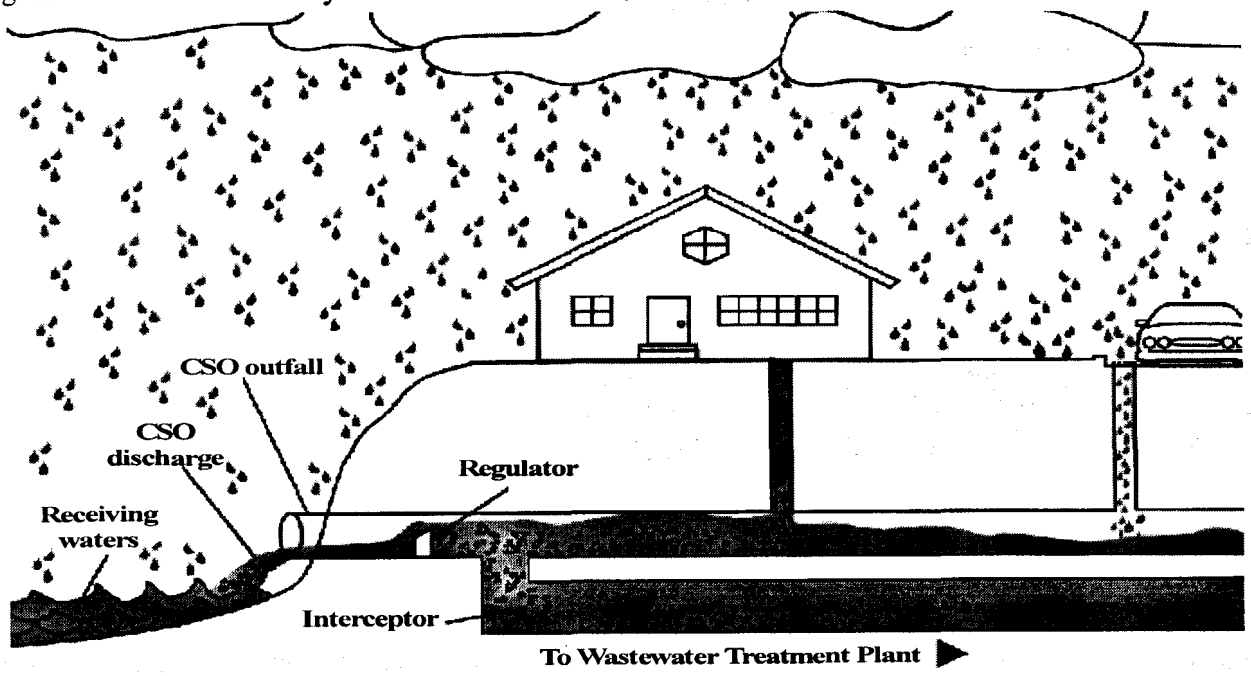


Table 5
CSO Control Construction Projects (Status and Cost)

NPDES Permit Number(s), **Permit Designated Name(s)**, and *Project Name (if Different)*	**Receiving Water**	**Cost Estimate**[1]		**Status**
MI00037427 **Oakland Co - Acacia Park CSO**	Rouge River	SRF: Federal: Local: Total:	$1,635,000 6,877,463 4,906,692 $13,419,155	CSO basin construction is complete and operational. Demonstration evaluation required. Final report due 1/2000. Project Performance Certification (PPC) required.
MI0025534 **Birmingham CSO**	Rouge River, Quarton Lake	SRF: Federal: Local: Total:	$4,179,821 16,666,891 12,264,402 $33,111,114	CSO basin, tunnel, and sewer construction are complete and operational. Demonstration evaluation required. Final report due 1/2000. PPC required.
MI0025461 **Bloomfield Hills CSO**	Rouge River	SRF: Federal: Local: Total:	$224,609 578,443 407,127 $1,210,179	Sewer separation complete and PPC being implemented. CSO outfalls eliminated.
MI0048046 **Bloomfield Village CSO**	Rouge River via Luz and Nichols Drain	SRF: Federal: Local: Total:	$3,135,000 13,907,526 10,260,151 $27,302,677	CSO basin construction complete and operational. Demonstration evaluation required. Final report due 1/2000. PPC required.
MI0025542 **Dearborn CSO**	Main Branch Rouge River	SRF: Federal: Local: Total:	$2,795,000 29,874,833 27,211,956 $59,881,789	Problems with tunnel site and construction. Estimated completion of construction is after 2000 (behind schedule.) NPDES permit reissuance on hold. Possible enforcement action.
MI0051489 **Wayne Co/Dearborn Heights CSO** MI0051811 **Dearborn Heights CSO** *Dearborn Heights*	Upper, Middle, and Lower Rouge	SRF: Federal; Local: Total: Additional costs for remaining CSOs	$2,650,000 14,464,563 7,116,985 $24,231,548	First demonstration basin construction complete and operational. Permit reissuances scheduled for late 1998. Demonstration evaluation required. Final report due 1/2000. PPC required. Additional Phase II controls needed to address remaining CSO outfalls.

Table 5
CSO Control Construction Projects (Status and Cost)

NPDES Permit Number(s), **Permit Designated Name(s)**, and *Project Name (if Different)*	**Receiving Water**	**Cost Estimate**[1]		**Status**
MI0022802 **Detroit WWTP** *Gates/Outlet Control Devices*	Main Branch Rouge River	SRF: Federal: Local: Total::	$0 2,589,409 2,313,577 $4,902,986	In-system storage construction is complete.
MI0022802 **Detroit WWTP** *Regulator & Gates Rehab*	Main Branch Rouge River	SRF: Federal: Local: Total:	$0 843,978 930,084 $1,774,062	Regulator and remote structural rehabilitation - expected completion in 1/1999.
MI0022802 **Detroit WWTP** *Hubbell-Southfield CSO*	Main Branch Rouge River	SRF: Federal: Local: Total:	$0 30,803,601 27,819,183 $58,622,784	CSO basin construction is underway - expected completion in 12/1998.
MI0022802 **Detroit WWTP** *Frisbee Sewer*	Main Branch Rouge River	SRF: Federal: Local: Total:	$0 1,622,008 1,937,530 $3,559,538	Construction underway - expected completion and operation by 10/1999.
MI0022802 **Detroit WWTP** *Puritan-Fenkell CSO*	Main Branch Rouge River	SRF: Federal: Local: Total:	$0 10,224,315 9,309,411 $19,533,726	CSO basin construction - nearing completion.
MI0022802 **Detroit WWTP** *Seven Mile CSO*	Main Branch Rouge River	SRF: Federal: Local: Total:	$0 8,855,114 7,842,020 $16,697,134	CSO basin construction - nearing completion.

Table 5
CSO Control Construction Projects (Status and Cost)

NPDES Permit Number(s), **Permit Designated Name(s),** and *Project Name (if Different)*	**Receiving Water**	**Cost Estimate**[1]	**Status**
MI0051489 **Wayne Co/Dearborn Heights CSO** MI0051543 **Wayne Co/Garden City/Westland CSO**	Middle Rouge	SRF: $2,416,469 Federal: 11,577,782 Local: 8,899,319 Total:: $22,893,101	Sewer separation projects completed 1997. PPC Underway.
MI0051471 **Wayne Co/Inkster CSO** MI0047601 **Inkster CSO** (to be superseded)	Lower Rouge	SRF: $2,600,000 Federal: 11,965,218 Local: 11,349,794 Total: $25,915,012 Additional costs will be incurred to address remaining CSOs	CSO demonstration basin is complete and in operation. Demonstration sampling began 6/1997. Permit reissuance scheduled for late 1998. Demonstration evaluation required. Final report due 1/2000. PPC required. Additional Phase II controls needed to address remaining CSO outfalls
MI0051462 **Wayne Co/Inkster/Dearborn Heights CSO** MI0051837 **Inkster/Dearborn Heights CSO**	Lower Rouge	Costs to be determined	Additional Phase II controls needed to address remaining CSO outfalls. Permit reissuances scheduled for late 1998.
MI0051802 **Livonia CSO** MI0051551 **Wayne Co/Livonia CSO** MI0051560 **Wayne Co/Livonia/Westland CSO** MI0051586 **Livonia/Redford Twp CSO** (to be terminated)	Middle Rouge	SRF: $0 Federal: 589,118 Local: 562,990 Total: $1,152,108	Sewer separation and elimination of CSOs is complete. PPC required. Three outfalls will be eliminated after completion of PPC.
MI0051586 **Livonia/Redford Twp CSO** (to be terminated)	Middle Rouge		CSO has not been used and has been recommended for termination.
MI0037621 **Oakland Co DPW - Farm Evergr CSO**	Rouge River		Originally a CSO, now an SSO. Reissuance is on hold, pending future termination following resolution of local issues.

Table 5
CSO Control Construction Projects (Status and Cost)

NPDES Permit Number(s), **Permit Designated Name(s)**, and *Project Name (if Different)*	**Receiving Water**	**Cost Estimate**[1]	**Status**
MI0051535 **Wayne Co/Rdfrd/Livonia CSO** MI0051527 **Wayne Co/Redford Township CSO** (to be superseded) MI0051829 **Redford Twp CSO**	Upper Rouge	SRF: $2,470,000 Federal: 9,713,340 Local: 5,843,654 Total:: $18,026,994 Additional costs will be incurred to address remaining CSOs	CSO demonstration basin complete and operational. Demonstration evaluation required. Final report due 1/2000. Additional Phase II controls needed to address remaining CSO outfalls. Permit reissuances scheduled for late 1998.
MI0028819 **River Rouge CSO**		SRF: $5,860,000 Federal: 14,170,985 Local: 14,182,769 Total: $34,213,754	Construction of CSO basin and pump station rehabilitation to begin in 1999. PPC required. Final report due 1/2000.
MI0051519 **Wayne Co/Wayne CSO**	Lower Rouge	SRF: $1,310,000 Federal: 4,204,152 Local: 3,358,966 Total: $8,873,118	Sewer separation complete and CSO outfall eliminated. Equalization basin complete. PPC required.
MI0026123 **Wayne Co - Rouge Valley CSO**	Middle and Lower Rouge		Pump Station 1A under construction. Permit to be terminated following completion.
MI0051594 **Wayne Co/WTUA/Plymouth Twp CSO** (to be terminated) MI0051578 **Wayne Co/Plymouth Twp CSO** (to be terminated)	Middle Rouge	SRF: $0 Federal: 570,637 Local: 570,265 Total: $1,140,902	Sewer separation complete, PPC is being implemented.

Table 5
CSO Control Construction Projects (Status and Cost)

NPDES Permit Number(s), **Permit Designated Name(s)**, and *Project Name (if Different)*	**Receiving Water**	**Cost Estimate**[1]	**Status**
MI0051501 **Wayne Co/Westland/Wayne CSO**	Middle Rouge	See below (MI0051497)	Sewer separation is complete. PPC required. CSO outfalls will be eliminated after PPC study.
MI0051497 **Wayne Co/Westland CSO**	Lower Rouge	SRF: $0 Federal: 3,989,101 Local: 3,369,776 Total: $7,358,877	Sewer separation complete. PPC is being implemented.
TOTAL EXPENDITURES		**SRF:** $29,275,430 **Federal:** 194,088,477 **Local:** 160,456,651 **Total:** **$383,820,558**	

[1]**Notes regarding costs:**

- Total project costs include planning, design construction, and construction engineering.
- All SRF and local dollar amounts are approved amounts for funding and do not include interest.
- Most costs are projected since construction costs are not finalized.
- Amounts do not include ineligible costs.
- Local costs include grant local share and additional local costs (projected) to communities.

KEY: CSO: Combined Sewer Overflow
PPC: Project Performance Certification
SRF: State Revolving Fund loan
SSO: Separate Sewer Overflow

The following activities have been conducted to address pollution from CSOs:

- Over $392 million in CSO control projects to protect public health are underway. Seven CSO control basins are currently in operation in the communities of Inkster, Detroit, Redford Township, Acacia Park, Dearborn Heights, Bloomfield Village, and Birmingham. Livonia, Plymouth Township, Wayne, Westland, and Bloomfield Hills have completed their CSO separation projects, and Garden City's is nearly complete. As a result, sixty-eight CSO outfalls are now under control, and data indicates that these basins are generally capturing 85% of CSO discharges in tributary areas.
- Construction of the two remaining CSO control basins in Detroit and Dearborn is underway. See Table 5 for a listing of projects and their status and Figure 10 for a map of areas draining to CSOs. This first set of CSO control projects is planned to be complete by the year 2000. Evaluation of the need for additional CSO controls to meet water quality standards has begun **(Recommendations B-1b, B-1c)**.
- Wayne County has retained the Water Environment Research Foundation (WERF) to peer review current CSO control projects and the need for future CSO controls **(Recommendation B-1d)**.
- Detroit, Dearborn, Dearborn Heights, Redford Township, and Inkster have begun the preliminary design work needed for future control of CSOs to address public health concerns **(Recommendation B-1d)**.
- DWSD is planning and designing additional CSO control projects to protect public health **(Recommendation B-1d)**:
  - The $524 million Upper Rouge Tunnel will be designed to provide treatment of CSOs by "first flush capture" and treatment through upflow shafts. If, however, a future geotechnical study shows soil problems, DWSD will replace the tunnel with equivalent basins.
  - $14 million in improvements for the Baby Creek Facilities are planned to ensure sufficient capacity for Allen Park, Dearborn, Melvindale, and Wayne County. The project will provide screening and disinfection for CSOs.
  - A number of programs are planned, totaling $322 million for both the Rouge and Detroit rivers, including residential downspout disconnection, residential catch basin restriction, residential tree planting, in-system storage, catch basin cleaning, street sweeping, household hazardous waste programs, system rehabilitation, source control pilot projects, wastewater treatment plant expansion, and real time control.

Livonia sewer separation

- U of M-D, with funding from the Rouge Project, conducted ambient water quality sampling at twenty-two locations in the watershed. The study provides baseline information about water quality so that the effectiveness of the CSO control projects may be assessed **(Goal B-1)**.
- MDEQ-SWQD staff analyzed data to determine the likely cause of the sharp dissolved oxygen (DO) depressions observed during storms downstream of CSOs. During some storm events, concentrations of DO downstream of CSOs drop to levels of 2 mg/l or less (concentrations of less than 5 mg/l are a violation of state water quality standards). These sharp drops have not been observed upstream of CSOs. Researchers concluded that the high levels of oxygen-demanding substances in the CSO discharges are the most significant cause of these drops in DO **(Recommendation B-1f)**.
- The Rouge Project has completed the sampling of influent and effluent of a CSO retention/treatment basin in Saginaw to test its efficiency. Data from this basin will be analyzed and used to facilitate preliminary planning for future Rouge River controls **(Recommendation B-1f)**.
- The MDEQ-SWQD and MDCH conducted caged fish studies on the Main Branch of the Rouge River in 1995 to study bioaccumulative contaminants and sources, in particular the Hubbell-Southfield CSO outfall. Levels of PCBs in fish downstream of the Hubbell-Southfield CSO outfall were twice as high as upstream fish, flagging this discharge as a large PCB source **(Recommendations B-1f, VIII-1a)**.
- DWSD, in conjunction with SEMCOG, Wayne State University, and USGS, conducted a toxics sampling study of four CSO outfalls on the Detroit River. Funded by a grant from the USEPA with matching funds

provided by DWSD, the study focused on toxic pollutants but included some conventional pollutants as well. The intent of the study is to develop a model that can be used to predict toxic loadings from CSOs based on the land uses in the watershed **(Recommendation B-1f)**.

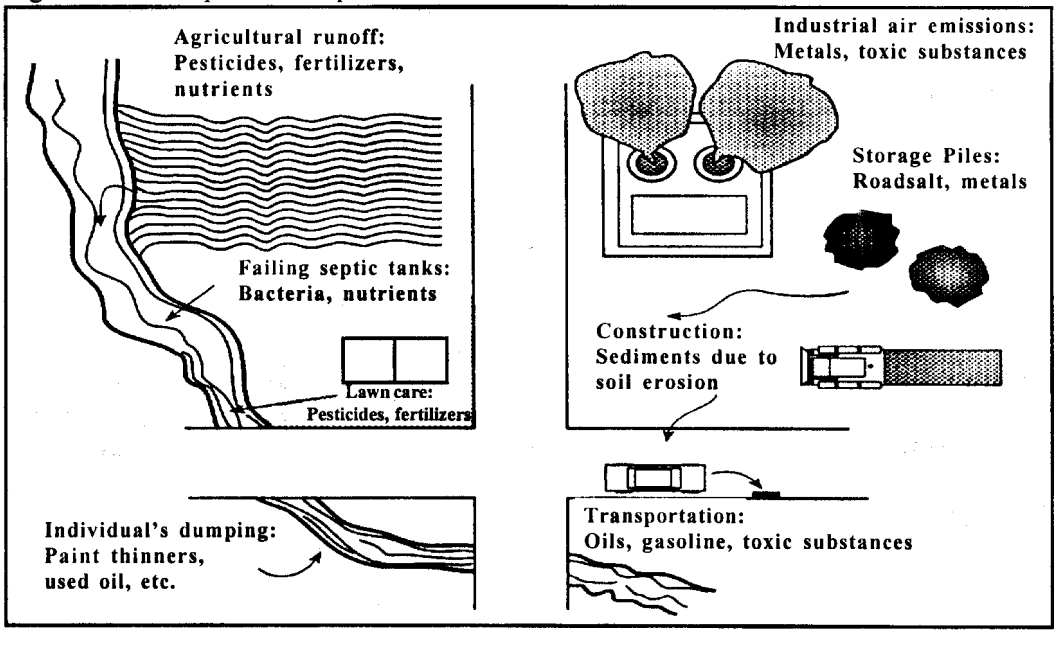
- DWSD submitted its Long Term CSO Control Plan on July 1, 1996, to MDEQ-SWQD. The plan served as the basis for the CSO requirements in the Detroit WWTP's current NPDES permit (along with additional conditions). Additional work will be needed well into the future **(Recommendation B-1a)**.
- DWSD has completed Phase I interim controls to optimize available in-system storage capacity, although it should be noted that many efforts will be ongoing **(Recommendation B-1b)**.
- DWSD continues to implement its Industrial Pretreatment Program (IPP), originally developed in the early 1980s, and has revised and updated it. The updated program allows for a more comprehensive approach towards implementation of the program **(Recommendation B-1j)**.
- Detroit revised its ordinance in 1996 to provide updated legal authority necessary for implementation of the revised IPP. The revision allows DWSD to impose additional control and reporting requirements for centralized waste treaters and issue special discharge permits to regulate releases of various cleanup waters and groundwater **(Recommendations B-1j, B-1h)**.
- DWSD has established a marketing committee with its first tier customers that is responsible for developing and distributing CSO project information **(Goal B-1)**.
- MDEQ-SWQD published the document Criteria for Success in CSO Treatment to help permittees and CSO control basin communities evaluate the effectiveness of the basins and plan any necessary future CSO controls **(Recommendations B-1d, B-1e)**.
- DWSD has expanded its Incident Prevention and Emergency Response group with staffing and improved response and investigation for tracking various incidents **(Recommendations B-1j, B-1h)**.

Nonpoint Source Pollution (NPS)

Rank 2

In the past, NPS pollution was generally considered to be contamination discharged from a widespread area or from a number of smaller sources. However, the definition of NPS pollution, along with its regulation, is evolving. Intermittent and highly variable in amount and type of pollutant, it was considered difficult to control and was not regulated under the Clean Water Act. Storm water is increasingly being regulated, however, and much of what we traditionally considered a NPS is now defined as a "point source." Storm water discharged from industrial sites, construction sites more than five acres in size, and some municipalities that are served by separate storm

Figure 11: Examples of Nonpoint Source Pollution



sewers is now (or will soon be) regulated as a point source and is discussed in the "Point Source Storm Water Discharges" section. When new federal storm water regulations (now draft) take effect, even more of the pollution that we currently call NPS will be regulated as a point source.

Discharges of NPS pollution to the river occur primarily during wet weather, when water moving over the surface picks up pollutants deposited from the atmosphere or derived from activities related to land use. Examples of NPS pollution include agricultural runoff, air deposition, sediments contaminated over time by many sources, and overland flow of storm water. NPS pollutants use up oxygen needed for survival by fish and other aquatic species and thereby degrade fish and benthic populations. NPS pollution is a major cause of impairment in most areas of the Rouge River Watershed. Because the NPS pollution sources are so diverse, the sources in this category are ranked separately. Storm water runoff and erosion ranked as the two most important types of NPS pollution.

Polluted Storm Water Runoff

Rank 1 of NPS Pollutants

Although largely unregulated in the past, control of storm water runoff has become a major focus. Considered a significant source of pollution, storm water may carry many different pollutants such as bacteria, heavy metals, nutrients, oil and grease, pesticides, and soil particles.

This section describes storm water that is still considered nonpoint source pollution and is not yet regulated under the MDEQ's NPDES permit program. Storm water discharged from industrial sites, construction sites more than five acres in size, and municipalities over 100,000 population that are served by separate storm sewers is currently regulated as a point source and is discussed in the "Point Source Storm Water Discharges" section of this chapter. Note that storm water runoff from nearly all communities (as well as other governmental entities) will likely be regulated as a point source under the NPDES program in the future.

The following activities have been conducted to address polluted storm water runoff:

- The Rouge Project has combined recent data collected through the project with historical data to establish baseline water quality during both wet and dry weather. Forty ambient stations and eight CSO stations are being monitored for oxygen demand, nutrients, solids, bacteria, and metals. The study also included sediment sampling at 182 sites and assessment of biological conditions in the river **(Recommendation CA-1a)**. In general, the data findings were as follows:
  - Ambient nitrogen concentrations were high and bacteria levels exceeded state standards for human contact at all stations. Cadmium and zinc concentrations sometimes exceeded state water quality standards.
  - Concentrations of pollutants were generally higher under wet weather conditions than during dry weather.
  - In regards to biological conditions, research indicates that conditions have improved in the Upper and Middle Rouge River, and have stayed the same or declined in the Lower and Main branches.
  - In some areas of the river, concentrations of zinc, antimony, PCBs, lead, and nickel in the sediment were at levels that are expected to cause toxic effects in aquatic organisms.
- See the "Point Source Storm Water" section for a description of the MDEQ's voluntary general permit for storm water discharges from separate storm water drainage systems as well as its regulatory program for storm water discharges from industries and construction sites **(Recommendations CA-1c, CA-1h)**.
- The Rouge Project has funded (along with local match money) the projects summarized below to study traditional storm water runoff controls such as sweeping streets and cleaning catch basins.
  - Dearborn Heights is working on a $100,000 street sweeping study to measure the effectiveness of more frequent sweepings.

- Redford Township will conduct a $150,000 project to examine three types of best management practices (BMPs) intended to reduce pollutant levels: in-line catch basin restrictors, catch basin cleaning, and street sweeping.
- Livonia and Farmington Hills will conduct a $200,000 catch basin maintenance study to see which operations best decrease the amount of pollutants released to the river.
- Westland designed and constructed a sedimentation basin and for an illicit connection investigation.
- Wayne County conducted a sand filter to treat storm water runoff from a parking lot in Wayne. This type of treatment system has been used successfully in other areas of the country and can be used to retrofit fully-developed areas where land for more conventional and less expensive BMPs is unavailable. Monitoring data has been collected but is not yet available for publication.

The Rouge Project published the document *Improving Community Storm Water Management – A Summary Guide of Ordinances for Rouge River Communities.* The guide provides a summary of the types of storm water ordinances currently in force in many of the Rouge Watershed communities. It is a tool to aid communities in creating a comprehensive local ordinance, or a series of ordinances, to reduce the adverse effects of storm water runoff. It includes seven sections including controlling storm water quantity and quality, soil erosion and sedimentation control, managing on-site sewage disposal systems, protecting wetlands, maintaining vegetative buffer zones and stabilizing streambanks, maintaining docks and other water dependent structures, and establishing wildlife corridors **(Recommendation CA-1f, Goal CA-1)**.

Washtenaw County's standards for design of storm water systems must be used by all private development under the Drain Commissioner's jurisdiction (which includes direct discharges to county drains, subdivisions and site condominiums, and other developments per local ordinance). Salem, Superior, and Ypsilanti townships have also adopted these standards. Washtenaw County's design requirements were recommended for adoption by all Rouge communities in the *Peer Review Report* and have been identified as a model for Great Lakes states in an USEPA publication. Traditional requirements for quantity management (storage of very large storms with release at gradual rates to prevent downstream flooding) are addressed along with requirements to treat "first flush" and "bankful" storms to ensure water quality and stream channel protection. Significant emphasis is placed on long-term storm water system maintenance **(Recommendations CA-1b and CA-1i, Goal CA-1,)**.

The Rouge Project is conducting a BMP demonstration project on almost 900 acres of property in Northville Township. The environmentally friendly, mixed-use development will demonstrate innovative solutions for handling storm water and develop guidelines for storm water management maintenance and operations **(Goal CA-2, Recommendation CA-2a)**.

The Washtenaw and Wayne conservation districts (NRCS), under a grant from the Rouge Project, completed the following projects in the Middle-1 and Lower-1 subwatersheds **(Goal CA-2, Recommendations CA-1g, CA-2b)**:

- Conservation plans were completed on over 2,500 acres of farmland.
- Soil testing was completed on over 1,311 acres of farmland and the results were shared with farmers.
- Over 3 acres of grassed filter strips were installed to provide a buffer between crop fields and streams.
- Four voluntary Farm-A-Syst evaluations were completed to educate farmers about issues such as safe pesticide and petroleum storage.
- Presentations on water quality and soils were given for Tonda Elementary School in Canton and at the Wayne County Fairground Rural Education Days.

- Over 440 Washtenaw soil surveys were published and provided to landowners and agencies serving the project area at no charge.
- With assistance from the RRAC-Nonpoint Source Pollution Subcommittee, NRCS conducted a river basin study for the Lower Rouge River entitled the *Lower-1 Subbasin Resource Plan, March 1997.*

- The Rouge Project created a manual, *Cost Estimating Guideline—Best Management Practices and Engineered Controls*, to help community planning and public works managers develop storm water runoff programs most effectively. It provides methods (both best management practices and engineered controls) for controlling storm water runoff and related cost information **(Recommendation CA-2a)**.
- Canton and Plymouth townships have completed an inventory of storm water detention basins in their communities. These inventories provided information on the general condition of the basins, necessary maintenance, and opportunities to retrofit the basins to improve water quality **(Recommendation CA-1b)**.
- The Rouge Project is piloting the effectiveness of a dry extended detention pond project in Cedar Lake. The project tested the effectiveness of a storm water detention pond designed to hold storm water for 24 to 40 hours during a storm. Preliminary results showed limited effectiveness **(Recommendation CA-1d)**.
- Canton Township's *Watershed Management Strategy* is a required planning tool for all new developments that emphasizes the importance of incorporating best management practices for storm water management. Part of this strategy is the "Clean Water Program," which will provide educational materials for residents and businesses. Workshops for homeowners' associations will describe detention basin maintenance and general water quality issues **(Recommendation CA-2a)**.
- Northville Township has begun to ask for storage of first flush storm water discharges in proposed developments. The township plans to make a formal modification to their storm water retention pond requirements **(Recommendation CA-1f)**.
- The Rouge Project is demonstrating the use of on-line media filter devices, used to filter out sediments and hydrocarbon products from storm water before it reaches the storm sewer system. These devices are not currently used in this area, but could be particularly useful in gas stations and small convenience stores due to their low cost. The filters are being piloted at two gas station sites, one in Livonia and the other in Westland. **(Recommendation CA-1d)**.
- Northville is implementing the Northville Mill Pond Restoration Design to restore the mill pond and enhance its function to treat storm water while providing opportunities for increased educational, recreational, environmental, and neighborhood aesthetic uses **(Goal CA-1)**.
- The Canton Township Enviro-friendly Golf Course Design will demonstrate comprehensive management of storm water runoff and will incorporate BMPs for turf management such as native prairie and wildflower buffer strips and natural habitat preservation. A design manual will be created to guide planning, construction, and maintenance of these types of golf courses **(Recommendation CA-2a)**.
- Wayne will retrofit several storm sewer outfalls with swirl technology oil/grit separators **(Recommendation CA-1f)**.
- Canton Township is implementing constructed wetland storm water detention systems for subdivision developments **(Recommendation CA-1g)**.
- The Stonewater Subdivision in Northville Township will utilize an underground sand filtration system to filter storm water before it is discharged to local lakes **(Recommendation CA-1f)**.
- Van Buren Township has applied for and received a grant from the Rouge Project to develop a storm water management plan. The objectives include 1) compiling physical data on the existing drainage systems, 2) determining future demands and impacts, 3) analyzing demands, 4) determining options for best flow management, and 5) recommending strategies to limit discharges **(Recommendation CA-1f).**
- The Wayne and Washtenaw County conservation districts' Agricultural Runoff Abatement Project has conducted soil testing and developed conservation plans to relay appropriate BMPs to farmers. BMP implementation will include the planting of filterstrips and assessments of woodlot management **(Recommendations CA-1g, CA-2b).**

- The Wayne County Jobs and Economic Development Enviro-friendly Mixed Use Development Project will result in a guidelines manual targeting developers and communities. The manual will document the planning strategy, institutional/financial framework, and incorporation of BMPs into a comprehensive management approach to protect water quality **(Recommendation CA-2a).**
- Northville Township and Wayne County's 960-acre planned unit development (which will include a mix of residential and other uses) will employ a centralized storm water quality and quantity management system which will utilize BMPs **(Recommendation CA-1f).**
- The Rouge Project has developed demonstration wetlands adjacent to the Lower Rouge in Inkster and is monitoring their effect on water quality. Results so far indicate that the wetlands are assimilating pollutants in storm water runoff that would otherwise be discharged to the river **(Recommendation CA-1e).**
- Ypsilanti Township has begun implementing their Storm Water Management Plan for all new developments. Developers must present their site plans to township engineers and then implement new township requirements for storm water detention and volumes. The township has also initiated the requirement for "pre-conceptual meetings." At these meetings, the developer, the drain office, the road commission, and other affected agencies meet to discuss all requirements and regulations to help direct the design of any new development **(Recommendations CA-2f, CA-2a).**
- The Washtenaw County Community Partners for Clean Streams Program encourages businesses to implement BMPs on their properties such as proper hazardous material storage and ecological landscaping practices. This is an established, on-going program that serves both the Huron River and Rouge River Watershed communities **(Recommendations CA-2f, CA-2a).**
- The Washtenaw County Headwater Protection and Storm Water Management Strategy Project will use GIS and modeling to establish storm water management standards, runoff rates, and ordinance language to guide communities in the development of similar programs **(Recommendations CA-2f, CA-2a).**
- Van Buren Township is currently implementing a project to reconstruct 6500 ft of the Denton Drain that is tributary to the Apple Run Drain and will ultimately lead to improvements to the Lower Rouge River **(Goal CA-2).**

Erosion on the Lower Rouge

Erosion

Rank 2 of NPS Pollutants

Erosion destroys the valuable and ever-shrinking habitat for aquatic life through loss of trees and streambank vegetation and deposition of mud and silts on stream bottoms. Suspended soil particles absorb the heat from sunlight, causing the water temperature to increase and decreasing the water's ability to hold oxygen. Low concentrations of oxygen make it nearly impossible for many forms of aquatic life to survive. In addition, suspended solids directly affect aquatic life by clogging fish gills, smothering eggs of aquatic insects and fish, and destroying the microhabitats of mayfly nymphs and other aquatic insects by siltation.

Erosion is caused by a variety of activities including construction, dredging, removal of vegetation within the watershed and along streambanks, and erratic stream flow. Note that erosion from construction sites five acres or greater in size is regulated as a point source and is discussed in the "Point Source Storm Water Discharge" section.

The following activities have been conducted to address erosion:

- In December of 1995, the Rouge Project surveyed the magnitude and extent of streambank erosion on the river's four major branches and selected tributaries. Survey results estimate that 60 to 90% of the river's banks in the major branches are eroded, with less erosion observed in the tributaries. Erosion was

worst in the lower parts of the Main and Lower branches as well as certain areas in the Middle Branch (Tonquish Creek and the Bell Branch). The effects of erosion were least along the Upper Branch **(Recommendation CB-1d).**

- In May of 1996, MDEQ-SWQD created the Rouge River Watershed Soil Erosion and Sedimentation Control (SESC) Core Group, a group consisting of representatives of SESC agencies. The SESC Core Group meets monthly to develop uniform SESC programs throughout the watershed, maintain better compliance, and reduce soil erosion and off-site sedimentation. To kick off the effort, MDEQ-SWQD hosted a symposium on February 15, 1996, to identify barriers to effective SESC programs. This group is open to all SESC agencies within the watershed and the contact person for more information is Marty Hendges at 734-953-1470 **(Recommendation CB-1a).**
- MDEQ-SWQD and the SESC Core Group held a second symposium on March 5, 1998, to present their work to all SESC agencies. Attendees were given a booklet of SESC work products, including SESC site plan requirements, uniform permit applications, acceptable control measures, enforcement tools, and enforcement guidance documents **(Recommendation CB-1a).**
- In the summer of 1998, MDEQ-SWQD and the SESC Core Group mailed a survey to all Rouge SESC agencies in an effort to learn more about soil erosion and sedimentation control programs in the watershed. Results will be used to direct future efforts **(Recommendation CB-1a).**
- In 1998, Washtenaw County passed a soil erosion and sedimentation control ordinance regulating all earth moving activities. The ordinance includes a resource remediation fee that allows money to be available on an immediate basis for clean up **(Recommendation CB-1b).**
- Walled Lake was awarded a grant from the Michigan Natural Resources Trust Fund to construct an erosion control system in the city's public park beach area **(Goal CB-1).**
- The Novi Soil Erosion Control Project will use a biodegradable blanket at a new subdivision construction site to test its effectiveness and will share the results to other communities **(Goal CB-1).**
- Ypsilanti Township has recently increased the enforcement of construction site erosion control measures with weekly inspections of all construction sites within the township **(Goal CB-1).**
- Westland and Wayne county parks installed a sediment basin to help maintain current sediment control at a cost of over $220,000 **(Goal CB-1).**

See "Degradation of Benthos," Chapter 2, and "Stream Flow," Chapter 3, for activities that relate to erosion.

On-Site Sewage Disposal Systems

Rank 3 of NPS Pollutants

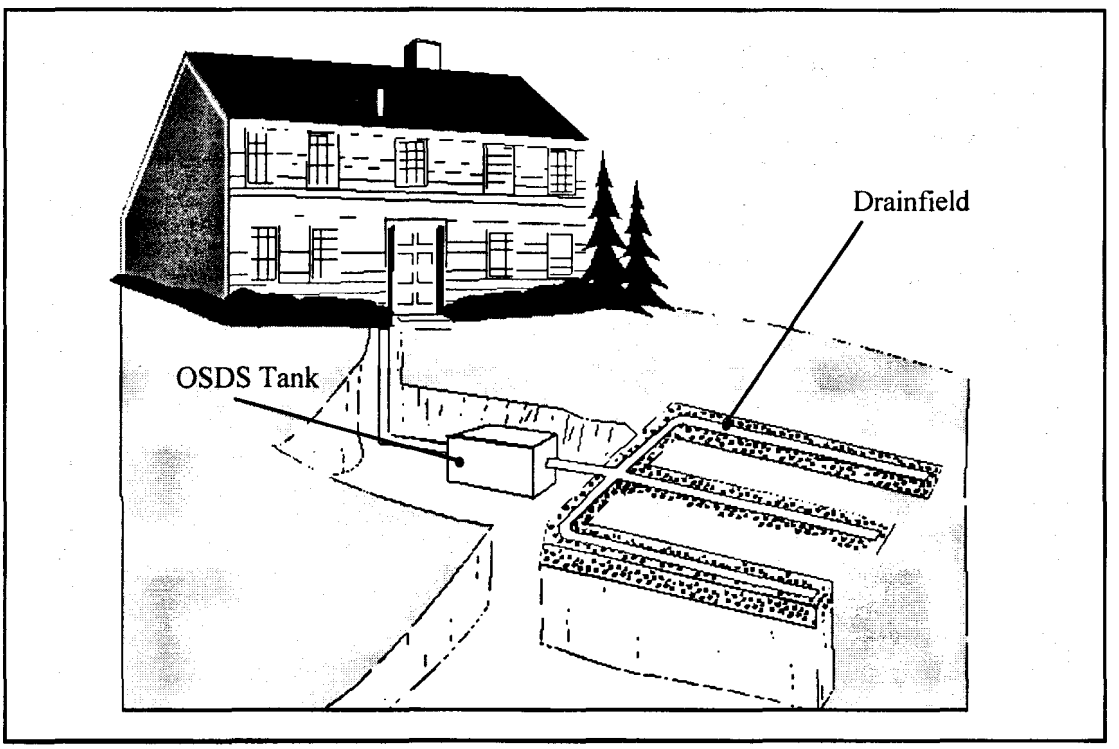
On-site sewage disposal systems (OSDS), commonly called septic systems, can provide effective wastewater treatment for many years, offering an alternative to sewers and municipal wastewater treatment plants in rural and semi-rural areas (see Figure 12). A number of areas within Rouge River Watershed communities use OSDS to dispose of their wastewater. A few of these areas are presently rural while others were once rural and are now urban. In the latter case, sewers were not installed in certain areas for a variety of reasons (such as difficult terrain, no available funding, etc.).

OSDS are, however, considered temporary and will eventually fail. Leaking OSDS can allow untreated human waste to be discharged directly to the river, causing a significant threat to the environment and public health. Because of this potential public health problem, county health departments regulate the installation and repair of OSDS. Increasingly, communities are moving toward eliminating OSDS when possible because of the high percentage of failing systems and the resultant risks to public health.

The following activities have been conducted to address pollution from failing OSDS:

- The Rouge Project developed a pamphlet on proper maintenance of OSDS. It also discusses the warning signs of system failure and how to address faulty systems.
- With a grant from the Rouge Project and local matching funds, Wayne County has conducted a $105,125 pilot project to develop a computerized database of OSDS and work with communities to educate their residents and correct system failures. Target communities include Canton, Northville, Plymouth, Redford Township, Dearborn Heights, Garden City, Livonia, and Westland **(Recommendations CC-1a, CC-1b)**.

Figure 12: On-site Sewage Disposal System (OSDS)



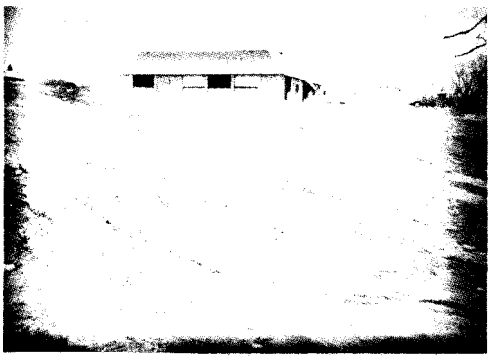
- In 1997, Wayne County conducted field surveys to identify failing and potentially failing OSDS in the Tonquish Creek and Middle 3 Subwatershed area (Canton Township, Dearborn Heights, Garden City, Livonia, Westland, and Plymouth and Redford townships. Of the 421 systems surveyed, 21% were found to be failing. Actions to address failing systems are now underway **(Recommendation CC-1b)**.
- The Rouge Project initially conducted a survey to detect failing OSDS using infrared and thermal aerial photographs **(Recommendation CC-1a)**.
- The RRAC-OSDS Subcommittee developed a guidance document for inspection of OSDS. The document provides a methodology to evaluate the adequacy of existing on-site sewage disposal systems and includes an OSDS inspection form to ensure that a uniform approach is followed during the inspection **(Recommendation CC-1a).**
- The RRAC-OSDS Subcommittee is investigating the development of an OSDS inspector certification program. The program may include classroom sessions and field training about the construction, operation, and maintenance of OSDS **(Recommendation CC-1a)**.

- The directors of Environmental Health for Macomb, Oakland, Washtenaw and Wayne counties have been working on a model regulation/ordinance to evaluate OSDS with staff from the Rouge Program Office. The purpose is to have a uniform approach to managing OSDS to protect public health and surface water quality. Some key elements include using a standard approach and inspection form, county certified private inspectors, education of residents and homeowners on the proper operation and maintenance of their system, and tracking the flow of septage in the watershed. County and local governments will be able to adopt this ordinance **(Recommendation CC-1b)**.
- Washtenaw County is developing a county regulation to require evaluations of all OSDS at the time of sale. Wayne County is considering a county regulation that would require inspections of all OSDS on a routine basis. Oakland County is looking at contracting with local communities for implementing a similar program **(Recommendation CC-1b)**.
- In 1995, Oakland County completed a second survey of OSDS in selected areas of Southfield and Farmington Hills. There was an overall failure rate of 39% in the 61 sites tested **(Recommendation CC-1a)**.
- Ypsilanti Township has adopted a property maintenance ordinance that requires regular inspection of commercial and rental properties to identify cross connections, OSDS that can be tied to the sanitary sewer, etc. Enforcement for corrections of any such violation is provided for by this ordinance **(Recommendation CC-1a)**.
- A map of OSDS reported in the 1990 census was distributed by the RPO to local health departments and the City of Detroit. The map shows that 18,242 OSDS were reported to exist within the watershed **(Recommendation CC-1a)**.

Contaminated Sites

Rank 3 of NPS Pollutants

River banks and floodplains have been used historically as dumpsites for all types of waste from construction debris to hazardous waste. People often "filled in" wetlands and other low floodplain areas with waste, believing that they were improving the land so it could be used for building sites. Factories were often located along the river's banks so they could use its water to readily dispose of wastes. The river is now eroding into some of these old dumpsites, and previously dumped municipal and industrial waste is being discharged into the river. More studies are needed within the watershed to determine the impacts to human health and the environment from these contaminated sites.



Warrendale site

In June of 1995, the state's environmental cleanup law was amended to make the party who caused the contamination responsible for the cleanup. Also, more cost-effective cleanup standards were adopted. The laws were changed to encourage a greater number of site cleanups as well as redevelopment. Under the revised law, someone buying a property (who did not cause the contamination) can avoid becoming liable for cleanup by conducting a baseline environmental assessment or site investigation to find out if a site is contaminated. Once that document is submitted to the MDEQ, an owner of contaminated property does not need to perform a cleanup but must protect the health and welfare of people who use the property. The owner is also required to prevent exacerbation of the environmental contamination. Previously, a new owner would have been liable for cleanup costs, which may have discouraged potential property buyers.

There are approximately 100 known sites of environmental contamination (and, additionally, a number of leaking underground storage tank sites) within the watershed. Most contaminated sites are regulated through Part 201 of Act 451 of 1994, as amended. Part 201 provides for the identification of contamination and any potentially responsible parties (PRPs), a risk assessment, evaluation, and cleanup of these sites. Recent changes to Michigan regulatory programs are aimed at making for a more equitable and responsive cleanup program (see description below).

Regulatory agencies include MDEQ's Environmental Response Division (ERD), Waste Management Division (WMD), Surface Water Quality Division (SWQD), and the Storage Tank Division (STD – formerly the Underground Storage Tank Division or UST).

The following activities are being conducted to address pollution from contaminated sites:

- In July of 1996, five pieces of legislation were signed to help provide permanent, ongoing funding mechanisms for the cleanup and redevelopment of contaminated sites. The legislation set up funding sources for cleanups, a new revolving loan fund to provide local governments with loans to assess sites and conduct demolition activities, and tax capture and tax credit programs allow local governments to set up their own local brownfield redevelopment financing programs. Ten Rouge Watershed communities have set up brownfield redevelopment financing programs (as of August 1998) and include Dearborn, Dearborn Heights, Detroit, Plymouth, Pontiac, Plymouth and Redford Townships, Westland, Ypsilanti, and Wayne County **(Recommendations CD-4a, CD-4b).**
- Over $12.6 million in state funds have been authorized for use for remediation at 17 contaminated sites in the watershed from 1995 through 1998. Sites that receive state funding are generally those for which no solvent
- Responsible party can be identified and also pose an acute public health or environmental problem. These sites are known as "orphan sites." Funded activities may include drinking water well replacement, site fencing, site investigation, source removal, and groundwater and soil cleanup. MDEQ-ERD evaluates sites in the state and proposes activities and funding **(Recommendation CD-2c, CD-2e).**
- MDEQ-ERD also administers the Site Reclamation Program, which provides funding to local units of government to investigate and remediate known sites of environmental contamination (often called brownfield sites) that will be used for economic development projects. Since 1995, approximately $1.2 million has been authorized to remediate five sites in the watershed **(Recommendation CD-2c, CD-2e).**
- MDEQ-STD regulates certain underground storage tanks and administers related programs on pollution prevention, cleanup of contaminated UST sites, emergency cleanup funding, and prevention of fire safety hazards **(Recommendation CD-4a, CD-4b).**
- The Rouge Project is developing a generic process for investigation and closure of abandoned dumpsites where future recreational use is planned. A draft reference manual has been published that describes the new process **(Recommendation CD-3d).**
- The RRAC-Contaminated Sites Subcommittee placed a Citizen's Guide to Contaminated Sites packet in 35 libraries in the watershed. The packet contains lists of contaminated sites, information on how to contact agencies involved in remediation activities, general information about how sites are investigated and closed, and references to address common questions about human health exposure and potential effects. A list of libraries with this material can be obtained from the MDEQ at 734-953-1441 **(Recommendations CD-6, CD-6a).**
- At the request of the WCDOE, the RRAC-Contaminated Sites Subcommittee prepared a list of recommendations for conducting public meetings. Recommendations included the inclusion of the public in site closures, making more information available to citizens, contacts for the agency in charge, a clear definition of the problem, a summary of strategies and/or remedies to be used, and a complete, accessible file on the site **(Recommendation CD-5).**

- The RRAC-Contaminated Sites Subcommittee participated in the closure of the Warrendale dumpsite, where the Dearborn Heights CSO basin was built. This closure was intended to be a demonstration of site closure. The subcommittee commented on the process and has suggested that there needs to be greater assurance that site closure is completed in accordance with permits and specifications. In addition, the group suggested that further research and review of the site capping materials should be conducted **(Recommendation CD-5).**
- Rouge Project researchers evaluated heavy metals in surficial soil in the Rouge River Watershed, reviewing more than 3,000 MDEQ files from investigations conducted at sites of environmental contamination. Soils were analyzed for heavy metals at 250 of these sites, totaling 6,000 samples. Results of this study suggest that accumulation of heavy metals in the urban environment primarily occurs at or near the surface of the ground. In addition, researchers concluded that an analysis of naturally occurring heavy metals may be impossible due to the distortion caused by metals from historic (anthropogenic) sources **(Goal CD-3).**

Contaminated Site Summaries

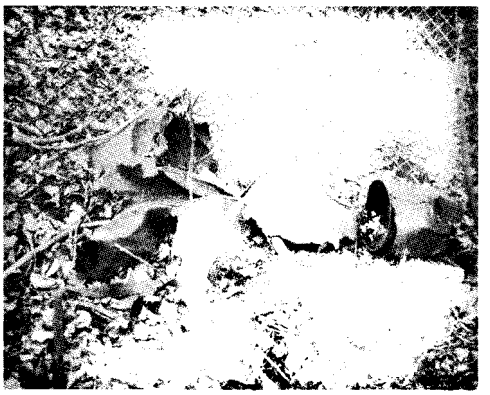
The following summaries are meant to be a general synopsis of contaminated sites that have undergone substantial remediation since the 1994 RAP Update was completed in early 1995. This list does not include sites that are not considered sites of environmental contamination by the state or USEPA. Contaminated sites are discussed only if they have had substantial activity.

ABC Drum & Barrel-Birwood (Site ID #820143)
ABC Drum & Barrel Company's main facility is located just north of the I-96 and Davison freeway interchange, between Wyoming Avenue and Meyers Road. The three-acre site is an abandoned drum reconditioning facility. MDEQ collected soil and sediment samples in the fall of 1995. The analyses indicated that the sediments within the building contained lead at levels up to 16,000 ppm. In addition, elevated levels of the volatile organic compounds styrene and xylene were found along with several polynuclear aromatic hydrocarbons (PAHs) and trace levels of pesticides. Demolition activities are now complete. An underground storage tank and contaminated floor drain have been removed. Site investigation is underway and on-site work is anticipated to be complete by early 1999.
State Expenditures: $1,728,140 **Projected Costs: $950,000**

Former Contaminated Fill near Beitz Creek (Marshall School) (Site ID #820227)
(Proposed for Deletion)
The contaminated fill near Beitz Creek in Livonia is an old landfill that was operated by Livonia in the 1950s and 1960s for municipal waste disposal. It is located next to Beitz Creek and behind the Marshall Elementary School. The creek has some erosion on the banks and some waste is exposed. There are also several leachate seeps flowing into the creek, which were sampled in 1992 and resampled in 1994. Benzene was detected at levels below state standards. An MDEQ-ERD toxicologist determined that there was no significant health risk at this low level. A full round of water and soil investigative sampling was conducted by the MDEQ's Geological Services Section. Review of the results indicated that there was no significant health risk associated with this site. This site is proposed for deletion from the 201 list because there are no contaminants in the groundwater or surface water at levels above state criteria.
State Expenditures: Not Available **Projected Costs: Not Available**

Cooper Elementary School (Site ID#820010)
This site is located at 28611 Ann Arbor Trail in Westland and encompasses approximately 40 acres. The site was an active municipal landfill until the early 1950s. After its closure, the Cooper Elementary School was constructed on the site. The contaminants of concern are lead, cadmium, chromium, mercury, and DDT. Lead was detected at nine times above the standard for human contact. The school has been closed due to overwhelming public concern for the safety of the students. The site has been permanently fenced off to restrict access. Other

remedial actions proposed include capping the fill area. Westland is working with a developer to cap the landfill and redevelop the property.


Illegal dumping

Detroit Coke Corporation (Site ID#821593)
Detroit Coke Corporation is approximately 60 acres located on W. Jefferson Avenue at the north side of the junction of the Rouge River and the Detroit River. Detroit Coke Corporation used to be a coking facility that also produced coke oven gas and coal tar as by-products. Soil sample results indicate that a direct contact hazard exists for PAHs and that the benzene concentration (16 ppm) in soils exceeded the indoor air inhalation criteria. The groundwater data indicates that PAHs exceed the groundwater/surface water interface cleanup criteria. There is coal tar and oil floating on the groundwater. Currently, the site is under enforcement action by the USEPA for RCRA closure. Detroit Coke is working with the USEPA to investigate and remediate the site.
State Expenditures: $210,000 Projected Costs: $8-9 million

Enterprise Oil (Site ID#820200)
The Enterprise Oil 3.1-acre site is located in northwest Detroit just south of the Lodge Freeway (M-10) on Linwood Avenue. The Enterprise Oil site operated initially as a petroleum distribution facility from 1956 to 1968. In 1975, the facility began receiving and storing waste oil from the automotive industry. Sampling data indicates that volatile organic compounds (VOCs) and semi-VOC contaminated soil extends across the site. The USEPA completed emergency removal of all above and underground storage tanks and residual product. Work has begun on the site. Buildings will be demolished in the fall of 1998 with site investigation to be completed in the spring of 1999. Focus Hope, a successful non-profit job training and social service provider, is interested in this property to expand its facilities by using the property for parking.
State Expenditures: $1,049,000 Projected Costs: $200,000

Feister Oil Co., Bulk Storage Facility (Site ID#821427)
Feister Oil Co. is located in Westland just northwest of the intersection of Ford and Newburgh roads. When development of the property directly southeast of Feister Oil began in the early 1980s, free product was encountered from an off-site source. The product has been fingerprinted and appears to be diesel fuel/#2 fuel oil and leaded gasoline, which have been stored in above-ground and underground tanks at Feister Oil since the 1960s. In October 1996, Feister Oil installed two borings/monitor wells adjacent to the above-ground tanks at the request of the MDEQ to investigate the presence of free product. Product was not encountered in these wells. Contamination from the underground tanks has not been investigated. The MDEQ believes a full-scale remedial investigation is needed to determine groundwater flow and the source of free product in order to delineate the full extent of contamination. The site is being proposed for fiscal year 2000 funding for investigation and possible remediation.
State Expenditures: Not Available Projected Costs: $950,000

General Oil (Mergraf Oil Site) (Site ID#820208)
The General Oil site is an active waste oil recycling operation located in Northville. Lake Success, an inundated former sand and gravel quarry, and Ford Pond, which drains into a tributary of the Rouge River, border the site. A now defunct company conducted oil recycling operations at the site from approximately 1950 through 1970. At various times, five unlined earthen lagoons were utilized to store waste oils containing chlorinated solvents. Soils proximate to the old lagoons are saturated with waste oils. Groundwater throughout the site is contaminated with chlorinated solvents (known human carcinogens). Free phase waste oils containing chlorinated solvents, PCBs, and heavy metals overlie the water table at three of the former lagoon locations. Drinking water wells adjacent to General Oil are threatened by the migrating chlorinated solvent plume and, consequently, are monitored for

signs of contamination. None has been detected as of August 1998. The property continues to be utilized for waste oil recycling operations by the current owner. A liability determination has not been completed, but the current property owner is actively operating a surface water free product recovery system and a recovery well upgradient of the surface water release. The MDEQ is in the process of completing an investigation to determine the proper remedial response action to halt contaminants from reaching the river.
State Expenditures: $680,000 **Projected costs: $470,000**

Lear-Siegler Plant (Site ID#820153)
The 13-acre Lear-Siegler Plant is located at 8341 Epworth Street in Detroit. The Lear-Siegler site is a former automotive parts manufacturing facility. The property has tax-reverted to the State of Michigan. The facility's environmental problems were first identified in 1990 by MDNR staff investigating a Pollution Emergency Alerting System (PEAS) report. Hundreds of drums, many leaking, containing unknown wastes, and subfloor storage vaults containing oils and large transformers were discovered. The presence of PCBs was confirmed in transformer oil and in the oils housed in subfloor vaults. The drums were confirmed to contain paint wastes and solvents. The EPA officially became involved at the site late in 1992. The EPA conducted an extensive removal program in 1993. No closure data is currently available. The facility remains vacant. This is one of the sites selected by a joint Detroit/MDEQ task force for accelerated cleanup efforts in the city in order to facilitate redevelopment. Preliminary cleanup activities involving building demolition and rubble removal/disposal were completed in January 1996. Phase I and II remedial investigations have been completed. Final closure samples will be taken this fall and final generic industrial closure should occur by the end of 1998.
State Expenditures: $3,086,067 **Projected costs: Not Available**

Michigan Ave. 94-18 Greenhouses (Site ID#821566)
This 13-acre site is located on the south side of Michigan Avenue between Inkster and Middlebelt roads in Inkster. Historical records indicate that the property had was utilized for greenhouse purposes from around 1924 to 1973. In 1994, Inkster hired consultants to conduct an Environmental Site Assessment (ESA), completed in 1995. Above-ground storage tanks (ASTs), suspected underground storage tanks (USTs), 55-gallon drums with contents, along with stained soil and stressed vegetation were noted across the site. Other environmental concerns included the presence of broken, friable asbestos, lead-based paint, smoke stacks, stockpiles, numerous empty drums, and a basement space in one of the garages with standing water. Inkster's Downtown Development Plan recommends re-zoning the property for multiple-family residential use. The owner (at that time) pumped out the UST (a sub-surface rail tank car) and the ASTs. The site ownership has reverted to the state. The drums, stockpiles, and the AGTs need to be characterized and removed. The stained surface soil, the pond, and the standing water in the basement room need to be investigated and most likely removed. The demolition debris and other waste materials should be removed. In addition, the building structures, USTs, and AGTs will be removed. Further investigation is needed for site closure. Funds were appropriated in FY97 and work is expected to begin summer 1998.
State Expenditures: $771,000 **Projected Costs: Not Available**

Michigan Avenue Dump Site (USEPA CERCLIS #312-886-0900)
This site is located in Canton Township on Michigan Avenue just east of Lilley Road. The site is bordered on the north by the Lower Rouge River. This site was used for the disposal of liquid and solid wastes including paints, resins, and adhesives. Contaminants of concern at this site include lead, zinc, PCBs, chromium, toluene, and xylene. This site posed several potential threats including dangers to public health and the Rouge River. The 3M Company has now completed Phase II of the cleanup, which involved a series of tests on the soil, groundwater, and surface water to follow up on their previous remediation activities. A proposed closure plan has been submitted to MDEQ but additional information is needed to evaluate impacts to the river. MDEQ will be obtaining this data.
State Expenditures: Not Available **Projected Costs: Not Available**

Middlebelt Hill (Site ID#820207)
This site is located on Hines Drive between Middlebelt and Inkster roads in Westland. This area of contamination is in a recreational area previously used as a toboggan hill. In the past, the Wayne County Road Commission agreed to allow Detroit's Sanitation Department to dump municipal waste on the hill to increase its slope. The contaminant of concern is lead. Woodchucks burrowing into the hillside have allowed contamination from within the fill to reach the surface. A groundwater investigation has been conducted. The Barnes Drain, tributary to the Middle Rouge River, does not appear to be impacted by contamination from this site. Vegetation has been removed and animal burrows filled with soil to discourage further burrowing. Wayne County has submitted a plan to cap the hill. MDEQ is reviewing the plan and will provide an opportunity for public comment. If this plan is approved, implementation is expected in spring of 1999.
State Expenditures: Not Available **Projected Costs: Not Available**

Nankin Township Dump Superfund Site (Site ID#821535)
This is a 12-acre site near the intersection of Cowan and Warren roads in Westland. This site is on the south bank of the Tonquish Creek and was used as a dumpsite for industrial and municipal wastes from the 1950s to the 1970s. In 1993, USEPA found partially buried drums, scrap metal, and exposed solid waste. Later sampling detected a number of hazardous substances including chromium, lead, zinc, toluene, and ethylbenzene. USEPA removed all buried drums and contaminated soil at this site and issued an administrative order requiring the PRPs to conduct cleanup activities. The PRPs have performed an investigation and agreed to complete a remedial action plan under P.A. 451, Part 201 to obtain closure of the site.
State Expenditures: Not Available **Projected Costs: Not Available**

National Airport (Site ID#820034)
This site, located in Westland, contains a former 30-acre "Old American Landfill" that accepted industrial waste and city trash from the early 1960s until the early 1980s. A parcel adjacent to the landfill was developed into the National Airport, which operated during the 1970s. During the late 1980s, drums were discovered on the site. Some were from the old landfill operation and some appeared to have been dumped more recently. MDNR conducted a surface cleanup in 1990 and 1991. A site owner conducted a hydrogeologic study of the landfill and surrounding land. In 1994, four PRPs agreed to pay for previous study costs and undertake future response activities. The PRPs have proposed a RAP and MDEQ has provided comment. MDEQ is working with the four PRPs for closure. A private party is also interested in developing the property under the Brownfield Redevelopment Act.
State Expenditures: Not Available **Projected Costs: Not Available**

Parcels at Poplar and 23rd Street (Site ID#821582)
This site consists of two vacant lots (1.16 acre) located at the northeast and southwest corners at Poplar and 23rd Street in Detroit. In the past fifty years, a coal yard and junk yard were in operation at the site. In late 1995 the MDEQ prepared a workplan and in March 1996 conducted an environmental brownfield redevelopment assessment. All surface soil samples had lead levels above the human direct contact hazard level. Many of the samples also contained PAHs above residential human direct contact hazard levels. All of the surface samples from the northeast parcel had PCBs above residential human direct contact hazard levels and approximately one quarter of the property had PCB levels above Toxic Substance Control Act (TSCA) levels. Detroit has indicated that the property may be used as parking areas for a local industry. USEPA has completed removal and disposal of the TSCA-level PCB soil and removal of the discarded gas cylinders. MDEQ is completing response actions by covering the lead-contaminated soils with asphalt paving. Work should be completed in the spring of 1999.
State Expenditures: Not known **Projected costs: $225,000**

Plymouth Industrial Center (PIC) Holding Company (Site ID#820044)
The PIC Holding 70+ acre site is an active industrial park located in Plymouth Township adjacent to I-275. Newburgh Lake is just south of the property. Evans Products Co. manufactured machine guns and metal parts at this site from the mid-1940s until the mid-1970s. During operation by Evans Products, disposal trenches were used to bury industrial wastes. Newburgh Lake was contaminated with PCBs from various industries, including Evans Products. Soil and groundwater contamination is present at the site. Soil is contaminated with vinyl chloride. Vinyl chloride is of primary concern because it has recently appeared in several of the monitoring wells and a groundwater extraction well. The property continues to be utilized for light manufacturing and storage. The current property owner has ceased operation of a groundwater capture system because of the change in liability standards contained in the Part 201 amendments of 1995. Remedial action will consist of assessment of the current remediation system, evaluation of natural attenuation as remediation, and groundwater modeling of the groundwater contamination. MDEQ is assessing the groundwater contamination to determine the proper remedial actions for the property.
State Expenditures: Not known **Projected costs: $650,000**

Recycling Corporation of America (aka RCA Recycling) (Site ID# 821586)
This city-owned 10-acre site is located on Melville Street in southwest Detroit. The site was formerly used as a processing point for demolition debris. It was the site of illegal operations by Recycling Corporation of America (RCA). The site is the subject of recurrent illegal fly dumping. The demolition debris contains high lead levels from paint and arsenic from wolmanized lumber. Its proximity to an elementary school causes concern for the physical and environmental conditions that are present. The property is one of the few available sites of this size in Detroit's Renaissance Zone. The city feels that this site is prime for redevelopment if the debris and environmental issues can be addressed. MDEQ is taking bids for the removal of the solid waste on the property and removal of one building. Once this action is complete, an investigation of the site soils will begin.
State Expenditures: $2 million **Projected costs: Not Available**

Former Selastomer Co. (Site ID#630857)
The site is located in a modern industrial park in Farmington Hills near Ten Mile and Haggerty Roads. The company was a large production facility that used plastic foam injection molding equipment. Solvents were stored in ASTs. The current owner conducted an environmental investigation of the facility. Solvents were detected in the soil at levels as high as 1000 times the health-based soil direct contact values. Pure solvent product was detected under the floor of the facility in the vicinity of the former indoor tank area and in the solvent storage area outside the facility. Fiscal year '95 funds were allocated to conduct free phase solvent product removal. Subsequent negotiations with the current property owner resulted in their commitment to conduct the removal. However, with the 1995 amendments to Part 201, the property owner is no longer a liable party and has therefore not conducted the removal. Additional funding may be needed after interim response activities, however, at this point, the amount and activity category is uncertain.
State Expenditures: $500,000 **Projected costs: Not Available**

Standard Tube of Detroit & Warehouse Club (Site ID#821523)
The 23-acre Standard Tube of Detroit site is a former steel tube manufacturing operation located in Redford Township. A county drain that discharges into the Rouge River borders the site. Steel tube manufacturing operations began in 1947 and continued until approximately 1985. During this time period, large amounts of oils were stored in several ASTs, USTs, quenching pits, and waste lagoons. After manufacturing operations ceased in 1985, Warehouse Club purchased half the property and transformed a portion of the factory into a retail outlet. County and state officials first investigated complaints concerning oil discharges from the site in 1990. In an attempt to mitigate the free phase oil problem at the facility, Warehouse Club closed several abandoned USTs and ASTs in 1994 and cleaned as much oil out of the underground utility system as was accessible. The new owner of the property is doing some cleanup work. State funds will be used to assist in the cleanup in order to facilitate redevelopment.
State Expenditures: $250,000 **Projected costs: Not Available**

Former Warrendale Site (Warrendale Rouge Dump) (Site ID #821537)
This site is closed. The closed Warrendale site is located near the intersection of Telegraph Road and Hines Drive in Dearborn Heights and consists of approximately 13 acres of waste. Detroit used this site for the disposal of municipal waste from 1936 to sometime prior to 1944. The area is presently being used as a county park and an underground CSO treatment basin. PAHs, arsenic, and lead have been detected at levels above the MDEQ's unlimited residential criteria. A human contact exposure barrier has been constructed over the existing waste. The barrier consists of a one-foot clay cap covered by six inches of topsoil and along the river a geosynthetic barrier and six inches of topsoil. To improve erosion control on the riverbank, the slope angle has been reduced and the bank armored with stone.
State Expenditures: Not Available **Projected costs: Not Available**

Welcome Center (Ambassador Properties) (Site ID#820145)
This site consists of approximately 180 parcels including the Ambassador Properties facility located at 1428 21st Street between Porter Street and Bagley Road across the street from American Customs. Historical information indicates the facility was used as an industrial dry cleaners from 1927 to 1967. In 1990, MDOT conducted an environmental audit. They identified several 55-gallon drums, a large underground vault (contents unknown), oil-stained wood pallets, two underground vats, and one UST. MDEQ completed a Phase I remedial investigation in February 1997 that identified current and/or potential environmental concerns at 24 of the 180 parcels. These parcels were identified based upon the known or suspected presence of USTs, observations of stained soils or stressed vegetation, and/or a history of commercial or manufacturing operations. Detroit is working with a developer to place a shopping center/commercial complex on the property. MDEQ is preparing a site feasibility study for all the properties. Two properties will be treated separately. One has an UST that has leaked gasoline. This property has an operating commercial business that will remediate the site. Another property has gasoline-contaminated soils that the MDEQ will try to have the liable party remediate. Development on the Welcome Center site is moving forward.
Expenditures: $700,000 **Projected costs: $200,000**

Dump Near Wick Elementary School Site ID#820014
The dump near Wick Elementary School site is a 118-acre site located northeast of Wick Elementary School on Wick Road in Romulus. The site operated as a landfill (Satterlee Dump) in the 1950s. It was closed in 1975 due to license violation when the practice of placing solid waste below the water table and allowing uncontrolled leachate to enter the county drains and wetlands was discovered. The USEPA conducted a site assessment in 1987. The MDNR removed several hundred badly deteriorated 55-gallon drums in April 1988. MDEQ discovered additional surface drums and removed them in 1996 along with drums from test pitting. Remedial investigation (RI) information indicates 15 feet of waste material at least three feet into the water table that is poorly covered at the surface. This site currently poses a public health risk to on-site users due to surface soil lead and PCB concentrations that are above the health-based standards for direct contact by humans. In addition, the concentrations of benzene, toluene, acenaphthylene, chloroethane, dibenzofuran in the shallow groundwater aquifer that vents into the surrounding wetlands exceed the surface water quality standard for the protection of aquatic life. The site is presently undergoing a human health and limited ecological risk assessment to determine the risks associated with the facility under its present recreational use. Romulus owns the property and would like to develop it as a golf course or for industrial/commercial use.
State Expenditures: $1.14 million **Projected Costs: $13.5 million**

Household Hazardous Waste

Rank 4 of NPS Pollutants

Household hazardous waste includes many chemicals commonly used in the home such as paint thinners, car battery acid, various cleaners, furniture polishes, insecticides, and glues. If a product can spontaneously catch fire, react or explode under certain conditions or when mixed with other substances, corrode other material or is toxic, it is usually considered hazardous. Many watershed residents dump these wastes down the storm sewers or in the ditches near their homes, not realizing they are hazardous. Many of these sewers and ditches discharge directly to the Rouge River or one of its tributaries. If not disposed of properly, household hazardous waste can cause impairments to fish and aquatic insect populations and habitats, contribute to formation of fish tumors and deformities, and degrade the aesthetic value of the river.

The following activities have been conducted to address improper disposal of household hazardous waste:

- Friends of the Tarabusi in Livonia and HNPA have included storm drain stencilling as part of their adopt-a-stream and Rouge Rescue efforts **(Recommendation CE-1c).**
- Livonia Eagle Scout Russell Walker earned his high rank through a special project with the HNPA-FOTR RiverWatch program. Walker located, numbered, stenciled, and mapped all pipe outfalls into the Tonquish Creek along the 4.2 mile stretch that flows through Holliday Preserve in 1997-98. Any questionable discharges can now be easily tracked back to specific storm drains for prompt corrective action **(Recommendation CE-1c).**
- The Rouge Project published a brochure for residents about the proper disposal of household hazardous waste that also includes tips on waste reduction and alternative products **(Goal CE-1).**
- With funding from the Rouge Project Community Pilot Program, the Central Wayne Energy Recovery Authority is developing alternative ways to fund household hazardous waste collection, set up household battery collection at city halls, and establish a permanent collection center. The $50,000 project will serve Garden City, Dearborn Heights, Inkster, Wayne, and Westland **(Recommendation CE-1b).**
- Washtenaw County runs a permanent program and drop-off facility for household hazardous waste called the Home Toxics Reduction Program. Program staff will be conducting community surveys to determine how it can most effectively serve areas of the county including communities within the Rouge Watershed. Special waste collection days are held at various township locations throughout the county on a periodic basis **(Recommendation CE-1b).**

Storm drains aren't garbage cans

Air Deposition

Rank 5 of NPS Pollutants

Pollutants, such as mercury, discharged into the air by industries and automobiles, can enter the Rouge River when they are carried back down to the earth as particles in rain and snow. One obstacle in eliminating pollution from airborne sources is that it can be carried from hundreds or even thousands of miles away. For practical purposes, the controls discussed in this document are limited to readily identifiable, local sources of air deposition.

The following activities have been conducted to address air deposition:

- Since the spring of 1996, DWSD has been conducting an atmospheric deposition study, and has agreed to share their results with the Rouge Project **(Recommendation CF-1b).**

Waste Management Division Regulated Facilities

Rank 6 of NPS Pollutants

MDEQ's Waste Management Division (WMD) regulates hazardous waste generators and transporters, non-hazardous liquid industrial waste transporters, landfills, waste transfer stations, waste processing plants and hazardous waste treatment, storage and disposal (TSD) facilities. Potential impacts from these facilities include the illegal discharge of leachate to the surface water or groundwater, storm water runoff that may be contaminated if not properly managed, and refuse that blows away from an active landfill area. In the State of Michigan, these facilities are regulated under Part 111, Part 115, and Part 121 of Act 451 of 1994, as amended.

The following activities have been conducted to address pollution from WMD-regulated facilities:

- In 1996, the MDEQ, U of M-D Student Internship Program, and SEMCOG (using funds from the Rouge RAP) developed a *Guide for Salvage Yard Owners*. The guide described proper management practices for environmental protection and was mailed to over 200 salvage yard owners in Southeast Michigan **(Recommendation CG-3a).**
- From 1996 to 1998, volunteer student interns from U of M-D visited each salvage yard within the Rouge River Watershed. The students educated owners and operators about proper waste management and spill prevention. More specifically, the students helped owner/operators determine which regulations applied to their facilities, assess any compliance issues, identify pollution prevention opportunities, reduce legal liability, and identify agency contacts for further assistance **(Recommendation CG-3a).**
- The Washtenaw County Pollution Prevention Program requires that all commercial businesses storing five gallons or more of hazardous materials to report hazardous material types and quantities, storage locations, chemical hazards, emergency contact information, contingency spill plans and site plans. The program also includes on-site audits to assist businesses with pertinent environmental rules and regulation **(Goal CG-1, Recommendations G-1a, G-1d, G-1e).**

Animal Waste

Rank 7 of NPS Pollutants

Excessive amounts of animal waste from ducks, geese, horses, cows and other animals can cause many water quality problems. Unhealthy levels of bacteria and nutrients can be carried in storm water from horse or cattle farms or pond areas where birds are fed. Where wild geese and ducks are fed, they tend to congregate in large numbers. These overlarge populations, in turn, create high bacteria levels, concentrated nutrients, reductions in available oxygen, and degraded streambank habitat. Feeding wild birds also creates an unnatural dependency on humans for survival. Severe negative impacts can also result from cattle or horses being allowed to walk and defecate in streams and waste being directly discharged to the stream.

Cow manure runoff from feed lot

The following activities have been conducted to address pollution from animal waste:

- Wayne County Parks Department has posted signs asking visitors not to feed the wildlife in Hines Park. Several other local governments have posted similar signs **(Recommendation CH-1a).**

- A major source of animal waste was eliminated from the Lower Rouge River in 1997 with a remediation project done at a dairy farm located in Canton Township. This facility had been discharging all of its animal waste from over a thousand head of cattle directly into the Fowler Creek for many years. The farmer has been required to divert his waste away from the stream onto nearby agricultural land and to develop a manure management plan for his facility. The discharge has been eliminated and the Fowler Creek is beginning to recover **(Goal CH-1).**

Point Source Storm Water Discharges

Rank 3

Under the 1987 Clean Water Act Amendments, certain storm water discharges are now regulated as point sources by NPDES permits. These discharges differ from nonpoint sources because they are discharged from a specific pipe or conveyance. Storm water runoff, which carries pollutants such as heavy metals, nutrients, and oils, is considered to be one of the most significant point sources of pollution.

USEPA storm water regulations, effective October 1, 1992, require that a discharge permit be obtained for storm water discharges from certain industries (specified in federal regulations) and from construction sites five acres or more in size. There are approximately 541 industrial facilities with storm water coverage in the watershed. Of these, 526 facilities have general permits that cover only their storm water discharges and 15 have individual NPDES permits that include storm water coverage (see the "Industrial and Municipal Point Source" section of this chapter). The number of construction site permits issued at any one time varies, of course, with the season and market. There were 228 storm water construction permits, for example, in the Rouge River Watershed in October 1997.

Storm water discharge point

Storm water discharges from communities that have a population over 100,000 served by separate sewers are also covered by this program. Livonia is the only community in the watershed currently covered by this regulation. Upcoming federal requirements, however, will regulate storm water from a broad range of communities and entities.

The following activities have been conducted to regulate point source storm water discharges:

- As noted above, the MDEQ-SWQD provides point source storm water permit coverage for 541 industrial facilities in the watershed, as well as numerous general permits for runoff from construction sites **(Recommendation D-1).**
- The MDEQ-SWQD issued a new Voluntary General Storm Water Permit on July 30, 1997, to cover discharges from municipal storm water systems and other governmental entities such as road commissions, public school districts, and public colleges. The permit, the first of its kind in the nation, focuses on control of storm water discharges through illicit discharge elimination, public education, and storm water pollution prevention. Permittees are also required to participate in the development of a watershed management plan.

  This permit was developed to facilitate cooperative efforts among watershed communities to address wet weather quality and quantity issues in a cost-effective manner. Participating communities will have the opportunity to demonstrate that a flexible, locally-driven program can effectively address storm water issues.

These storm water discharges are not currently required to be authorized by NPDES permits, and coverage is therefore voluntary. If effective, however, it is expected that jurisdictions with Voluntary General Storm Water Permit coverage will be able to continue their local program in lieu of other mandatory federal requirements that will likely take effect in 2002.

This permit program is unique and has become a national model. A majority of Rouge Watershed communities and agencies plan to apply for the Voluntary General Storm Water Permit by January 1, 1999. Interested communities have been working with the subwatershed pilot groups to coordinate their efforts—see Chapter 1: Storm Water Advisory Group Reports **(Recommendation CA-1c, CA-1h).**

- The Rouge Project and the MDEQ-SWQD sponsored a workshop on November 18, 1997, on the Voluntary General Storm Water Permit for communities in the Rouge River Watershed. The workshop included information and discussion about the permit, grant resources available through the Rouge Project, and break out sessions to discuss four planning elements of the permit. Over 100 people attended, representing over 50 communities and agencies. Several subsequent general permit workshops have been presented by the Rouge Project and MDEQ **(Recommendations CA-1c, CA-1h).**
- Westland was the first community statewide to apply for and obtain a Voluntary General Storm Water Permit. This community has already begun implementation of their public education and illicit connection/ discharge program. Other Rouge River Watershed communities will be applying in early 1999 **(Recommendations CA-1c, CA-1).**

Stream Flow

Rank 4

There are two factors that strongly affect stream flow in the Rouge River Watershed: geology and the increasing amount of impervious surfaces. The first, geology, establishes the physical grade of the river's stream channel and the permeability of the soils. In the headwaters (where the river begins), the hilly glacial moraines have encouraged swift moving, groundwater-fed streams with stone bottoms that make good habitat for many cool water fish species such as trout. The greater portion of the river, however, flows through relatively impermeable clay soils. Low grade, slow, meandering, clay-bottom streams characterize these areas, where surface water runoff (generally warmer and more polluted) makes up the greater percentage of stream flow.

The ever-increasing amount of impervious surfaces within the watershed has an even greater impact. Urban amenities such as parking lots and roads prevent rainwater from soaking into the soil and recharging groundwater. Instead, rainwater inundates the river, causing erosion during storm events, while the decreased groundwater input creates unhealthy low-flow conditions during dry weather. Research has found that when over ten percent of a subwatershed is comprised of impervious surfaces, the river is degraded (Schuler et al). A Rouge Project study (Kluitenberg 1994) estimates that thirty-one percent of the Rouge Watershed is impervious. Low flows are a source of impaired uses in all but the lower reaches of the Main Branch of the river where the stream has been channelized.

The following efforts are underway to address stream flow issues:

- The Rouge Project has funded (along with local match monies) the following projects to control storm water flow through its community pilot project program **(Recommendation E-1b):**
  - The Oakland County Drain Commissioner will install a $1.26 million outlet control structure at the Caddell Regional Storm Water Detention facility to increase detention time and thereby reduce streambank erosion downstream;
  - Canton Township conducted a $111,000 study to explore funding mechanisms for ongoing maintenance of detention ponds, train citizens regarding proper maintenance, and assess the condition of existing detention ponds; and

- Livonia will create a $200,000 regional detention pond to provide a regional solution to the existing erosion problem. The pond will reduce surge flows to reduce streambank erosion and improve water quality.

The Washtenaw County Office of the Drain Commissioner is planning to develop a model ordinance for limiting impervious surfaces in 1999 **(Recommendation E-1b).**

Contaminated Sediments

Rank 5

Aerial view of drained Newburgh Lake

Sediments in many areas of the watershed are contaminated by historical and current industrial activity. Sediments become contaminated when certain persistent pollutants, such as metals and organic chemicals, are released to the environment. These pollutants easily adhere to soil particles. The last 5.5 miles of the Main Branch of the river has been designated as a site of environmental contamination under Part 201 of Act 451 of 1994 because sediments contain pollutants such as lead, cyanide, barium, chromium, copper, zinc, and numerous organic chemicals. PCBs have also been of concern, especially in the Newburgh and Nankin Lake impoundments on the Middle Branch of the Rouge River. Contaminated sediments are of concern throughout most of the Rouge River Watershed.

The following activities have been conducted to address sediment contamination:

Sediment removal in Newburgh Lake

MDEQ-SWQD removed 6,900 cubic yards of PCB-contaminated sediment from Evans Products Ditch. The cleanup began in January of 1997 and was completed in March 1997 **(Recommendation F-1c).**

The Rouge Project has removed an estimated 530,000 tons of PCB-contaminated sediment from Newburgh Lake. The project began in late 1996 and was completed in October 1998 **(Recommendation F-1b).**

U of M-D researchers studied the concentrations of certain heavy metals in sediments along the Lower Rouge River. The study revealed higher-than-background levels of pollutants in the highly urbanized downstream portion of the river as well as two upstream sites where abandoned dumpsites appear to be the source **(Recommendation F-1a).**

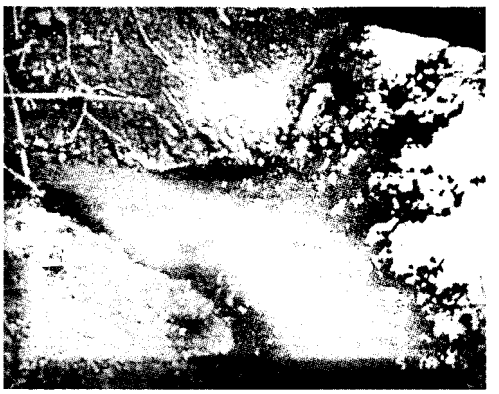
U of M-D has proposed to demonstrate the ability of certain plants to remediate metal-contaminated sediments, to increase the genetic ability of indigenous plants to clean up these sediments, and to demonstrate the use of this bioremediation technique in a variety of environmental settings **(Goal F-1).**

U of M-D researchers analyzed surface sediment collected along all four branches of the Rouge River in 1994-95 for a number of heavy metals, total organic carbon (TOC), and grain size distribution. Metal concentrations in sediment were found to generally increase with decreasing grain size and increasing TOC content. Concentrations were highest in the downstream reaches; the entire watershed, however, was found to suffer from contamination **(Recommendation F-1a).**

In conjunction with USACE maintenance dredging in the Main Branch of the Rouge River, the USACE conducts sediment sampling every five years for heavy metals, organics, PCBs, and other pollutants. The next scheduled sampling will take place in 1998 **(Recommendation F-1a).**

Illegal Dumping/Discharges

Rank 7



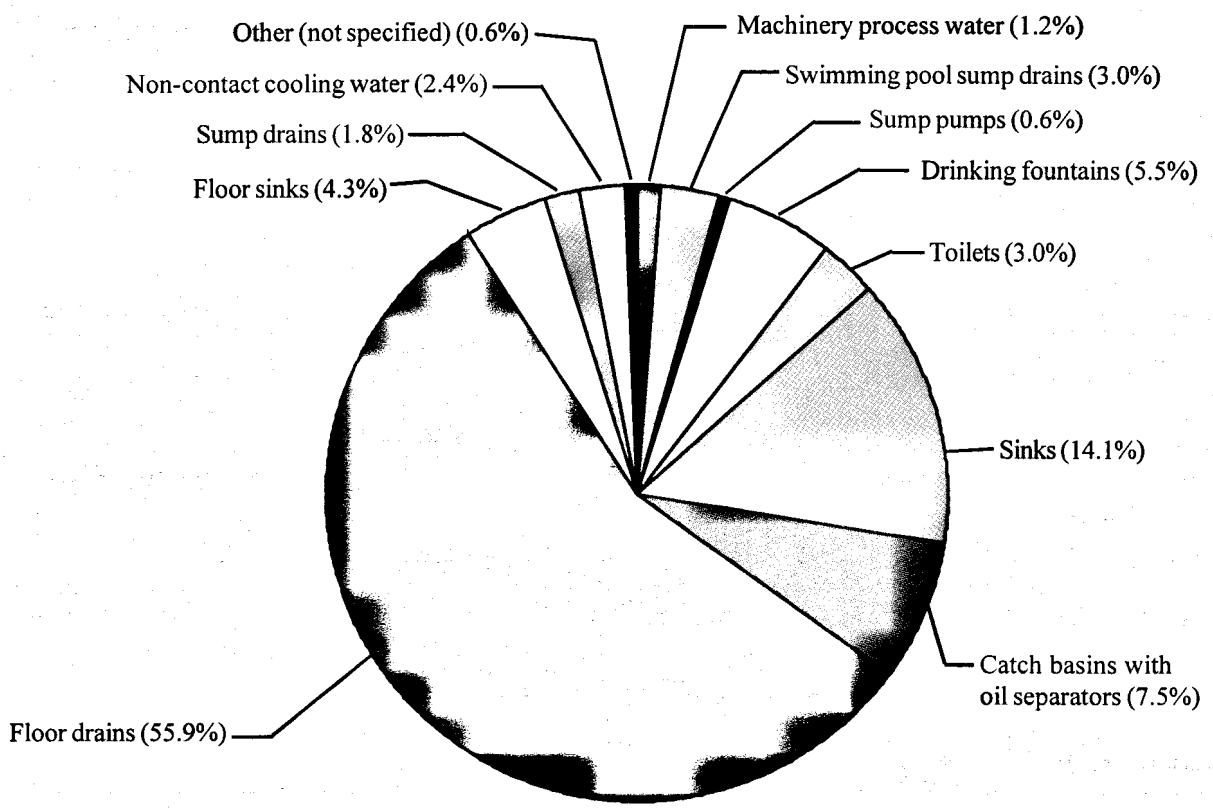
Pollutants entering the river

Sometimes individuals, industries, and businesses illegally dump or discharge pollutants into the Rouge River. A truck may dump wastes into a stream or a business may be improperly connected to a storm drain that discharges directly into the river. A variety of pollutants can reach the stream through these actions, including oil, gasoline, paints, and other waste chemicals.

The following progress has been made to address illegal dumping and discharges:

- Westland is purchasing a special television camera at a cost of $225,000, to view interior sewer lines and locate illicit connections **(Recommendation G-1a).**
- 500 businesses in the Middle Rouge have been dye tested by the WCDOE to check for illicit connections. Forty two facilities had violations, 30 of which have already been corrected. In addition, 500 manholes were surveyed to find areas discharging pollution into the river. Of these, 120 are being investigated further due to suspicious material found during the survey **(Recommendation G-1a).**
- Governmental entities that obtain the new Voluntary General Storm Water Permit to cover discharges from municipal storm water must develop an illicit discharges elimination program as a permit requirement **(Recommendation G-1b).**

Figure 13: Types of Illicit Connections in the Rouge River Watershed from 1995 to 1998



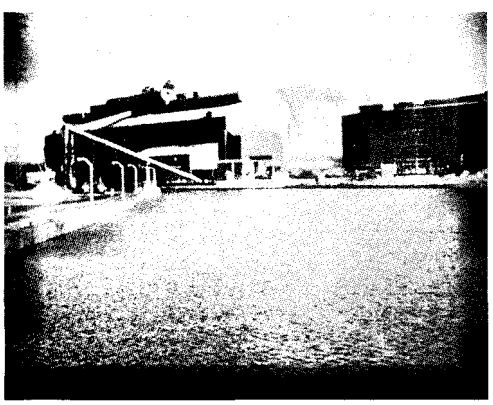
- The MDEQ-SWQD conducted an illicit discharge investigation along 8 Mile Road in Farmington Hills to find the source of waste oil and raw sewage discharges to the Bell Drain. Two industries, AT & G, Inc. and Approved Manufacturing Company, Inc. were identified as responsible parties. As a result of this investigation, a three-day cleanup was conducted in the drain. Six discharge pipes (two carrying sanitary waste and four transporting oil-contaminated wastewater) were terminated or connected to the sanitary sewer (instead of the storm sewer) **(Recommendations G-1a, G-1b).**
- Washtenaw County received a $100,462 USEPA grant to address illegal dumping issues. Current activities include the following:
  - Working with communities to promote citizen participation, developing public education materials, formalizing reporting procedures and establishing channels to communicate illegal dumping incidents.
  - Developing GIS mapping of illegal dumping sites.
  - Participating in the Southeast Michigan Illegal Dumping Collaborative to provide training on environmental crimes to law enforcement agencies.
  - Formulating model agreements for interagency reporting of illegal dumping activities.
  - Implementing electronic access capabilities to report chemical inventories.

  (Recommendations G-1a, G-1d, G-1e)
- Dearborn Heights and Garden City are studying necessary ordinance changes that may be required to eliminate illicit connections **(Recommendation G-1b).**
- Wayne County has established an "Illegal Dumping Hotline" at 1-888-223-2363.

Permitted Municipal and Industrial Point Source Discharges

Rank 7

Under federal and state law, it is illegal for a facility (also known as point sources) to discharge treated or untreated wastewater to surface waters in Michigan without a NPDES permit. The MDEQ-SWQD administers the NPDES permit program in Michigan and issues both individual and general permits. Individual permits are tailored for each permittee and usually authorize more complex discharges than general permits. General permits authorize the discharge of effluent that has the same characteristics and therefore the same requirements for each permittee. These permits are usually issued more quickly than individual permits. General permits are issued only to applicants that meet specific requirements and whose discharge is one of the fourteen types for which general permits have been written.



Ford Rouge Plant

Twenty-eight point source dischargers have individual NPDES permits in the Rouge Watershed. A list of these dischargers can be found in Appendix A. There are also approximately 541 general permits: 526 for storm water runoff from industrial facilities, eight for treated groundwater (from cleanups), six for noncontact cooling water, and two for hydrostatic pressure test water. In addition, there are a variable number of general permits for storm water runoff from construction sites, usually over 200 at any one time. **See the section on "Point Source Storm Water Discharges" for more information about storm water permits.**

Most industries physically located within the Rouge River Watershed do not discharge to the river directly. Instead, they discharge into the Wayne County collection system. The DWSD, in turn, is required by its NPDES permit to administer an Industrial Pretreatment Program (IPP) for these industrial dischargers. The program requires these industries to reduce their pollutant discharges to levels preset by DWSD. This ensures that pollutants discharged to the wastewater treatment plant will not adversely impact DWSD's collection or wastewater treatment systems.

The following activities have been conducted to address pollution from permitted municipal and industrial point source discharges:

- The MDEQ-SWQD continues to administer the NPDES program. Most permits in the Rouge River Watershed were reissued in fiscal year 1997. Applications for new use permits are processed as they are submitted **(Recommendation H-1a).**
- Five additional general permits have been issued since 1994 to facilitate more timely permitting of the following types of discharges: wastewater stabilization lagoons, sand and gravel mining wastewater, wastewater from cleanup of water contaminated by gasoline and related petroleum products, secondary treatment wastewater, and municipal potable water supply **(Recommendation H-1a).**
- MDEQ-SWQD issued the Voluntary General Storm Water Permit **(Recommendation H-1a)**. For more information about this permit, see the section in this chapter on "Point Source Storm Water Discharges."
- DWSD (in conjunction with the Michigan Dental Association, state and federal regulatory agencies, special interest groups, academia, and wastewater experts) developed, coordinated, and managed a raw mercury collection program to collect surplus mercury from Michigan dentists. From January to June 1996, more than 400 dentists across the state participated in the program. Approximately 1,340 pounds of raw mercury were collected and shipped to a refining company **(Recommendations H-1b, H-1c).**
- DWSD, as part of its continuing PCB and Mercury Minimization Program, has initiated a pilot program for laboratories within the service area to develop control strategies for mercury use and disposal within Michigan laboratories **(Recommendations H-1b, H-1c).**
- Wayne County and MDEQ have joined efforts to provide waste reduction assistance to businesses in the Rouge River Watershed through the Rouge Friendly RETAP (Retired Engineer Technical Assistance Program). Retired engineers and other related professionals provide on-site pollution prevention and energy efficiency assessments. Assessments are nonregulatory, confidential, and free of charge. For more information call 517-335-0081 or look at the website *www.deq.state.mi.us/ead/retap*. **(Recommendation H-1b, H-1c).**

Chapter 4
Financial and Institutional Arrangements

"Birmingham is a Rouge community which has been involved in the National Wet Weather Demonstration Project. The city has participated in the construction of three retention treatment basins at a significant cost both in terms of dollars and physical disruption in the community. The support from the Remedial Action Plan has been significant in this effort and the real beneficiaries of the plan are the children in the 48 communities who will grow up in an improved environment with a cleaner river and in a healthier community."

Coco Siewert
Former Mayor of Birmingham

Birmingham CSO control construction

The concept of an institutional arrangement for the Rouge Watershed activities means many things to many people and is truly a "work in progress." There are several institutional arrangements being proposed within the watershed boundaries. Among these proposed arrangements are the coordination of existing subwatershed groups, the overall coordination of remedial activities within the watershed, the development of a revised RAP, and the development of revised goals and objectives for the watershed.

The subwatershed groups, established in each of the seven subwatersheds, have become one established institutional arrangement within the Rouge Watershed. They have been meeting for over a year and have been instrumental in organizing the governmental entities within the subwatershed. One of the primary activities for these groups is the development of permit applications for the Voluntary General Storm Water Permit. These organizations are currently determining their formal operational structures and defining their roles within the watershed. However, there appears to be general concurrence among the seven subwatershed groups that they should, at a minimum, be able to do the following:

Tour of a CSO control basin

- Coordinate actions among their members to prepare a joint subwatershed management plan under the provisions of the General Storm Water Permit;
- Make recommendations on the allocation of federal funds available under the Rouge Project on a watershed wide basis and make specific decisions within the subwatershed on grant distribution;
- Provide a forum to discuss common needs and share information among subwatershed group members;
- Help build consensus among communities, public agencies, and the general public on the goals, objectives, and priority actions required to restore, maintain, and protect the Rouge River; and
- Provide subwatershed representation and/or input into the revisions of the Rouge River Remedial Action Plan and other watershed-wide issues.

Although there is no definitive proposal at the moment, there seems to be general concurrence that a watershed-wide institutional arrangement for the Rouge Watershed should be, at a minimum, able to:

- Coordinate the Watershed Management Plans developed by the individual subwatershed groups;
- Provide a forum for public input into the RAP process;
- Develop goals and objectives that are applicable throughout the Rouge watershed;
- Provide advice on the distribution of grant funds to the groups within the watershed;
- Provide a forum for dispute resolution among the subwatershed groups and various governmental organizations;
- Provide advice to the MDEQ on the necessary actions to remediate and protect the Rouge River Watershed;
- Develop the Rouge RAP for submittal to the MDEQ and facilitate implementation of the remedial actions established in the plan; and
- Evaluate and track progress in restoring and protecting the Rouge River and attaining the goals and objectives of the Rouge RAP.

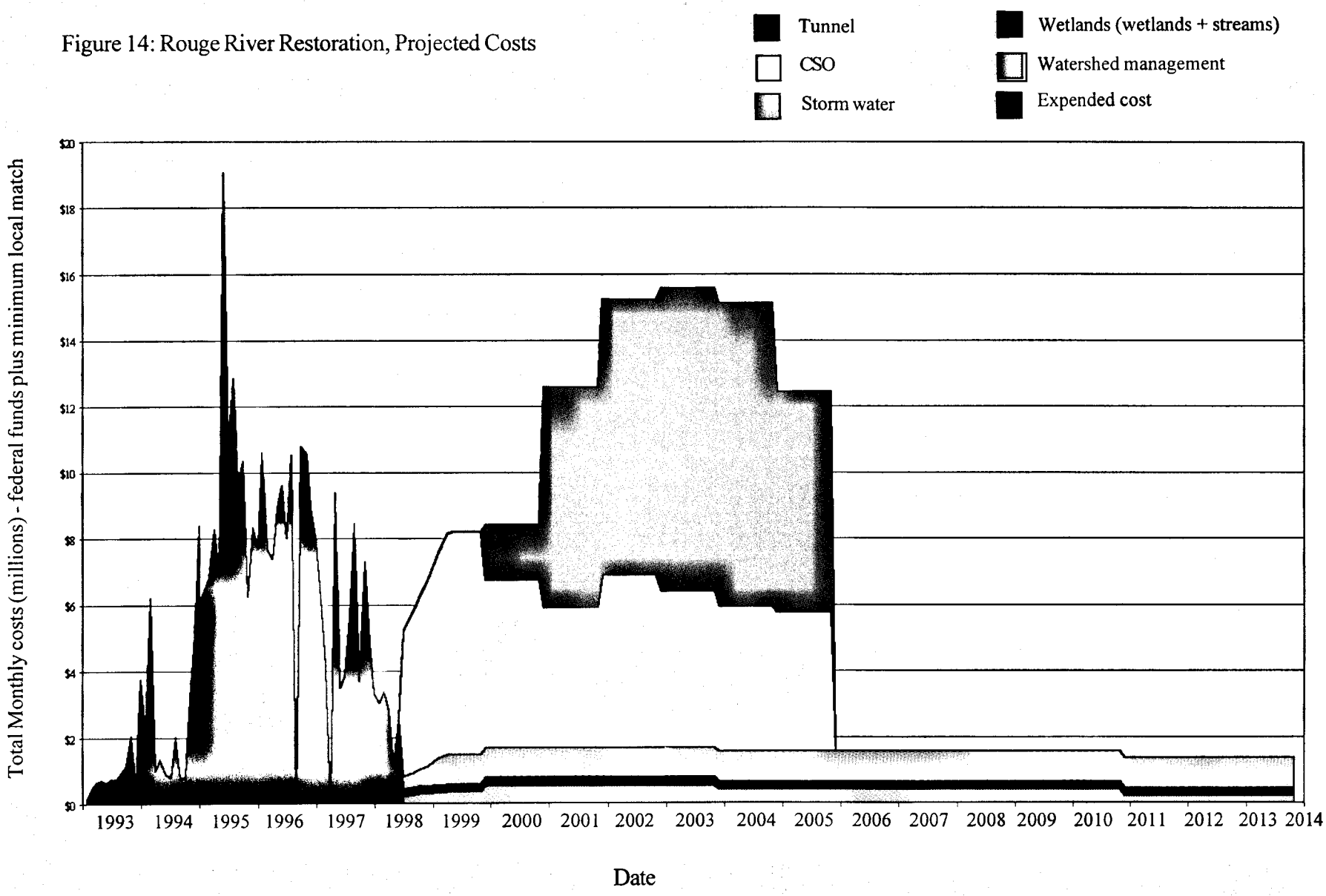
Based on information from surveys conducted amongst the governmental organizations in the watershed, the MDEQ should continue to be the institution responsible for compliance and enforcement activities throughout the watershed. However, the local communities and the counties will also have a significant role in this area. For example, the local communities will be initiating corrective actions and enforcement activities, if necessary, within their own communities for such items as illicit connections to storm sewers they own and/or operate. The counties will in general be responsible for initiating actions necessary to correct problems associated with on-site sewage disposal systems.

The following activities have been conducted to develop an institutional framework for the funding and implementation of the Rouge RAP:

- The Rouge Project has continued to obtain federal funding, expected to total $330 million by the end of 1998. Including local matching funds, this project has made $503 million available to address wet weather pollution in the watershed **(Recommendation J-1a)**.
- Most communities are participating in a SWAG to coordinate with other communities and apply for a general NPDES permit to manage their storm water. The Rouge Project is planning to distribute $2 million in funds to the SWAGs for planning and implementation purposes **(Recommendations J-1, J-1a)**. See Chapter 1 for a discussion of the subwatershed effort to address storm water pollution problems.
- The Rouge Project community grant program continues to transfer federal grant funds to local communities and agencies. Forty pilot storm water projects are being conducted by local communities and agencies; a second set of GIS projects were awarded to 13 communities in July of 1998; and ten applicants were selected for recreation and habitat grants. Proposals for wetlands creation and restoration projects were also accepted in August of 1998 **(Recommendation J-1a).**
- DWSD has signed an agreement with its first tier customers (those with direct contracts with DWSD) regarding its CSO Plan. These customers include the Rouge Watershed communities of Allen Park, Dearborn, Farmington, Highland Park, Melvindale, Redford Township, Wayne County, and Oakland County. This partnership is designed to enable participants to identify common goals, facilitate communication, and share responsibilities. Issues identified so far include benefits, flows, system costs, rates, communication, and contracts. The goal is to work together to mutually resolve these issues and develop an equitable distribution of the cost of the CSO Plan by July of 1999 **(Goal J-1).**
- The Federal District Court and its appointed monitors continue to urge watershed communities to comply with state and federal law in the pending civil action. At dispute is the control of pollution caused by CSOs: who will pay for CSO controls and how much control is required. The court assisted in negotiations among the communities and the MDEQ and developed a phased approach to CSO control. Current efforts focus on meeting public health standards. Other water quality standards will be addressed in the future. Although consensus has not been reached, communities and other stakeholders in the watershed continue to seek ways to administer the financial and institutional arrangements necessary to address pollution on a watershed-wide basis **(Recommendation J-1d)**.
- Many communities have provided local match funds for the CSO control projects in their communities, expected to total $172 million by the end of 1998: Birmingham, Bloomfield Hills, Bloomfield Village, Dearborn, Dearborn Heights, Detroit, Garden City, Inkster, Livonia, Redford, River Rouge, Wayne, Western Wayne County Utilities Authority (WTUA), and Westland. See Table 5 for a detailed listing **(Recommendation J-1a)**.
- Communities continued to receive SRF funds for their CSO control projects. See Table 5 for a detailed listing **(Recommendation J-1a)**.
- Dearborn Heights voters have approved a 2.5 mill tax increase to finance sewer and water improvements **(Recommendation J-1a)**.
- Dearborn Heights is participating in a Rouge Project pilot Geographic Information Systems (GIS) program covering one square mile. Results of the study will demonstrate potential GIS need and how GIS can contribute to watershed management **(Recommendation J-1e)**.
- Redford is studying the feasibility of integrating municipal GIS and the Rouge Project GIS. The $129,000 project will develop processes and procedures for effectively sharing data and information **(Recommendation J-1e)**.
- The communities of the Lower 1 SWAG have been awarded grants from the RPO to facilitate watershed studies and evaluation of programs **(Recommendation J-1e).**

- The Rouge Project is conducting GIS Pilot Project in the Upper-2 Watershed. Funded by the Rouge Project, the effort is designed to demonstrate the use of GIS in watershed management in conjunction with Livonia, Farmington, Farmington Hills, Novi, Redford Township, Northville Township, and Detroit. Preliminary findings are that GIS data is transferable and is compatible for the sake of integration. The project convened technical and watershed management advisory groups. They acquired datasets from all but one community and were able to successfully integrate them. Another finding was that the counties of Wayne, Oakland, and Washtenaw are all developing compatible GIS basemaps. Partially as a result of this project, SEMCOG has formed a Regional GIS Coordination Committee. The final project report is expected to be completed by October 1998 **(Recommendation J-1e)**.
- Wayne is developing a GIS system to delineate areas of the storm water system for annual inspection and to prioritize areas of the system for cleaning. Database log forms will be developed to document information gathered during cleaning operations **(Recommendation J-1e)**.
- The Rouge Project reviewed the economic and financial condition of four communities (Inkster, Dearborn, Dearborn Heights, and Redford Township) with respect to their ability to fund the projected costs of CSO controls **(Goal J-1).**
- The Rouge Project commissioned a special study of storm water management options and related issues and several communities were selected to participate in the institutional arrangements study. The report was completed in 1995 **(Recommendation J-1b)**.
- The Rouge Project funded an analysis of the legal options for regulating storm water on a watershed or subwatershed basis. The report outlines current federal and state authority available under existing law that could be used to manage storm water based on hydrologic or watershed boundaries rather than political jurisdiction. The report was completed in April of 1996 **(Recommendation J-1b)**.
- FOTR administers the Rouge Education Project (REP). The REP is partially funded through grants from the Rouge Project. A school-based fair-share contribution plan was introduced during the 1996-97 school year. In the fall of 1997, the REP launched its Adopt-a-School Campaign which increased the number of local businesses and corporations which contribute to the REP **(Recommendation J-1a)**.

Figure 14: Rouge River Restoration, Projected Costs



Chapter 5
Education/Coordination/Information

"History has taught us that we are capable, through ignorance, of devastating natural areas and depleting natural resources, often beyond recovery. But it has also taught us that with awareness and understanding, with knowledge and concern, we can undo some of the damage, we can avoid repeating the same and similar mistakes, we can repair, maintain, and rebuild the natural areas and resources that sustain and enhance life on this planet."

Orin Gelderloos
Professor of Environmental Studies,
University of Michigan - Dearborn

Studying the Rouge River

Lack of education and coordination of activities plays an important role in the degradation of the Rouge River. Residents may unknowingly pollute the river by applying excessive amounts of fertilizers to their lawn or improperly disposing of household hazardous wastes down storm sewers. Government officials may add to the river's problems through lack of coordination or non-protective land use practices.

Students sampling the river as part of the Rouge Education Project

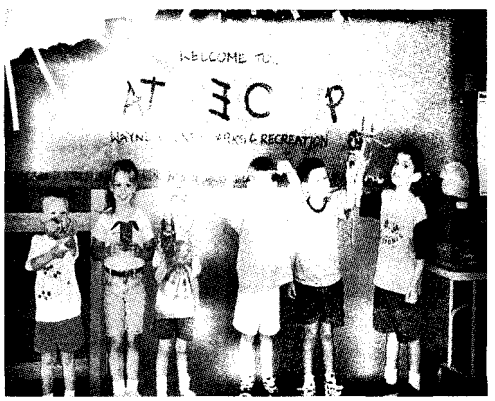
Extensive and long-term pollution of the Rouge River leads many residents within the watershed to believe it is merely an "open sewer" with no chance of ever being clean again. A change in attitude is necessary to make remediation activities successful. Public officials and citizens are more likely to support projects to clean up the river when they understand how they impact water resources and how vital those resources are to their quality of life.

The public education challenge for the future will be to build on past successes and the increasing strength of partnerships with a wide range of organizations. Continued outreach with watershed-wide public information messages and activities are vital to the future. At the same time, the variations among subwatersheds and individual communities supports the need for community-specific education and public involvement efforts.

The following activities have been conducted to address education and coordination:

- The Rouge Project has developed an extensive amount of public education materials and activities to help promote the Rouge River cleanup project and **educate residents about what they can do to prevent pollution (Recommendations K-1c, K-1j, K-1h).**
  - Over 50,000 Rouge River Activity Books have been distributed to schools in the watershed. These books convey river-friendly information through crossword puzzles, word searches, and other games.
  - A Rouge Riverfest was held at Eliza Howell Park in cooperation with the FOTR and the Brightmoor Concerned Citizens. The event was held in conjunction with Rouge Rescue '96.
  - A Rouge Project Home Page was developed and is available on the Internet at the following address: *http://www.rougeriver.com*
  - Movie theater ads were shown in 10 theaters in 1996. The ads promoted river protection and volunteerism.
  - In conjunction with the RRAC Education Subcommittee, over 100,000 placemats were distributed to restaurants in the watershed. Two different placemats featured (1) a FOTR poster contest winner and tips on preventing pollution and (2) a map of recreational areas in the watershed.
  - The full collection of Rouge Project publications was distributed to a dozen public schools and university libraries.
  - Two user-friendly, touch-screen, educational kiosks have been developed for display in watershed libraries and other public places. The computer systems display maps, photographs, graphics, and text to underscore the value of the Rouge River and promote the watershed approach to restoration.
  - The RPO published a 20-page illustrated booklet titled, "Rouge Repair Kit." It includes a self-assessment test for citizens and it explains how they can take steps to improve water quality protection.
  - In conjunction with the FOTR storm drain stenciling program, fish-shaped door hangers were developed and distributed to promote the newly stenciled storm drains and provide pollution prevention tips.
  - The Rouge Project created a portable display titled, "Our Actions Affect the Rouge," featuring a map of the Rouge River Watershed with community boundaries. During 1997 the display was set out at over 40 community events. An estimated 25,000 people of all ages have learned about their watershed.
- The Rouge Project has created the colorful fold-out map and index *Rouge River Watershed Public Recreation Areas and Activities.* This practical guide was created to encourage use of existing recreational areas and shows where facilities are located and lists what amenities they offer **(Goals L-1, L-2, Recommendations L-2a, K-1l).**

- The Rouge Project is implementing two "Rouge Friendly" programs to promote stewardship of the river by targeted businesses and specific neighborhoods: the Rouge Friendly Business Program, providing assistance regarding pollution prevention to local businesses, and the Rouge Friendly Neighborhood Program, informing residents about how they can help protect and restore the river. Residents receive a guidance manual as part of the neighborhood program **(Recommendations K-1j, K-1h).**
- Washtenaw County is expanding their Community Partners for Clean Streams program to the Rouge Watershed. Similar to the Rouge Friendly Business Program, the program works with business and institutional land owners to evaluate their operations for potential impacts to local waterways. A comprehensive set of handbooks with best management practices specific to all business activities and hands-on technical assistance are provided to participating businesses **(Recommendations K-1j, K-1h).**
- During the summer, U of M-D, in partnership with the USEPA Region V, conducts an Environmental Education Institute for middle and high school teachers in Southeast Michigan. The program encourages teams of teachers from different subject areas (within the same school) to apply and use an interdisciplinary approach to expand awareness of local environmental resources and issues. Teachers have the opportunity to develop curriculum activities for the communities where their schools are located **(Goal K-1).**
- Washtenaw County is now developing a "Guide to Rural Living" handbook, coordinated by Washtenaw MSU extension, that will be available to all new residents. The handbook includes guidance on reporting illegal dumping, spills and releases, environmentally sound landscaping and grounds management practices, living near county drains, developing wildlife habitat, and more **(Recommendation K-1h).**
- U of M-D broke ground on May 22, 1998, for its new 13,000 square foot, $3.5 million environmental interpretive center. The new center is located within a 300 acre natural area traversed by the Rouge River. The university recently received state funding (requiring a 25% match) for the center, which will facilitate research and environmental enhancement, restoration, and recreation. More specifically, the center will serve as a focal point for education on the Rouge River Watershed through programs on biodiversity, the value of floodplains, and citizen contribution to habitat and water quality improvement. The center is slated for completion by the year 2000 **(Recommendations K-1k, L-1b).**
- Washtenaw County distributes education materials to citizens. Materials include a fact sheet on nonpoint source pollution and prevention strategies. An "adopt a catch basin" doorknob hanger is in production, and will be distributed by field crew in urban portions of the Rouge Watershed whenever work is done. Other county departments also provide similar materials on a routine basis.



Wayne County Parks summer program

- U of M-D has set aside 70 acres of its campus as an environmental study area, which is open to the public daily, sunrise to sunset. The university also supports the Rouge River Bird Observatory. Each year, 8,000 school students, their teachers, and over 30,000 community residents visit the area. The Natural Areas Department provides guided programs, written information, classes, and special events. Events have been hosted for children as well as adults and have ranged from saw-whet owl banding to a six-legged scavenger hunt (for insects) **(Recommendations K-1k, K-1l).**
- Wayne County hosted its first annual "WaterFest" to educate 1200 students from around the watershed about all aspects of water. The event was held in May 1998 at U of M-D. The festival was well received and plans are already being made for next year's event **(Recommendation K-1b).**
- With funding assistance from the Rouge Project, the *Observer & Eccentric Newspaper* developed a multipage insert, "Changing Currents," which described the history, current recreational opportunities, and future challenges for the Rouge River. The insert was published May 16, 1996, and distributed to over 160,000 households **(Recommendation K-1d).**

- For nearly a year, the *Observer & Eccentric Newspapers* featured a monthly column about the Rouge River **(Recommendation K-1d).**
- The Washtenaw County Office of the Drain Commissioner has developed a slide presentation and related materials for local planning commissioners and officials. The presentation explains the impact of watershed development and increased imperviousness on local water resources and suggests tools and techniques to minimize negative impacts **(Recommendation K-2a).**
- In May 1996, the Rouge Project hosted a media tour that coordinated with the FOTR student monitoring day. Twelve newspaper, television, and radio station representatives participated; media coverage included articles in two local newspapers, a radio and a television interview, and a series of reports on public radio in conjunction with the Great Lakes Consortium **(Recommendations K-1d, K-1j).**
- Washtenaw County's Emergency Response Manager organizes a weekly radio program covering significant environmental topics often relevant to watershed protection that is broadcast on WEMU (89.1 FM) at 8:20 a.m. on Wednesday mornings. Recent programs have included environmentally sound landscaping, proper disposal of household toxics, illegal dumping, and construction erosion control **(Recommendations K-1h).**
- A progress report on the Rouge RAP is available via the Internet at the following address: *http://www.deq.state.mi.us/swq/docs/rougeriv.html*. This report, along with progress reports from other Michigan RAPs, is hotlinked to the Great Lakes Information Network's homepage **(Goals K-1, K-2).**
- The Rouge Project, FOTR, and the RRAC-Education Subcommittee developed a presentation about Rouge initiatives and volunteer opportunities and have set up a speaker's bureau **(Recommendation K-1g).**
- Dearborn mails brochures to its residents regarding household hazardous waste collection, recycling, composting, and cross connection control each year. The city also makes presentations to local groups and through the local cable channel about these issues **(Recommendation K-1h).**
- Detroit promotes pollution prevention, especially concerning household hazardous waste, through a variety of programs and activities **(Recommendation K-1h).**
- SOCRRA has been actively promoting proper lawn fertilization and care to residents in Oakland County. Over 35 homeowners volunteered to be part of their demonstration lawn project. Volunteers will receive technical assistance and advice and, in return, will keep records of their lawn care practices and observed results **(Recommendation K-1h).**
- Wayne County has set up a 24-hour hotline (1-888-223-2363) to provide the public with information about the county's environmental services **(Goal K-1).**
- Wayne County Parks continues to offer outreach programming for school groups, scouts, and families at Nankin Mills Interpretive Center. Since January 1998, 3,200 visitors have been involved in nature programs. One school program called "Water Wonders" explores the water cycle, the Rouge River Watershed, and the impacts people have on water quality **(Goal K-1, Recommendation K-1p).**
- Garden City's public education efforts about storm water permit issues include appearances on cable television and briefings at three city council workshops **(Recommendations K-1c, K-2c).**
- Dearborn Heights, HFCC, and FOTR have developed a Rouge Watershed Education Center at HFCC's Dearborn Heights campus to coordinate and implement subwatershed public education efforts. Continued and future support from the Rouge Project and subwatershed communities is planned. This center is also the new home of FOTR **(Goal K-1).**
- In March 1998 the first FOTR and Rouge Project-sponsored Rouge River Stewards Workshop was convened at HFCC in Dearborn Heights. A group of 24 committed citizens are volunteering their time to participate in self-initiated community education projects. The goal is for River Steward volunteers to become an educational resource for municipalities and civic associations **(Goal K-1).**
- The Salem Township Public Awareness Project will result in useful, community-specific education materials and will involve public meetings, focus groups and surveys to determine how to guide a long-term Salem Township public awareness and education program with an emphasis on its upstream opportunity to prevent pollution **(Recommendation K-1h).**
- Walled Lake is initiating a public education program focusing on its almost 100% residential community that recognizes the lake as one of its greatest assets. The city will use displays and Enviroscape models to increase public awareness in this headwater community **(Recommendation K-1h).**

- The Salem Township/South Lyon Schools Outdoor Environmental Education Lab and Interpretive Trail Project is close to completion and has involved the stewardship of parents, students, and community members in the area that will continue to maintain the lab and trail **(Recommendation K-1k).**
- Plymouth and Canton Townships have developed a "Clean Water Program" which consists of a series of educational materials for homeowners and businesses and will be hosting a series of educational workshops for homeowners and business associations **(Recommendation K-1h).**
- Canton Township has visited 20 public school classrooms to introduce the educational game "Enviroscape" to students. Before initiating this program, the township held focus groups with teachers to discuss the best way to approach a watershed education initiative **(Recommendation K-1h).**
- Canton Township is implementing their Fellows Creek Regional Detention & Public Education Program **(Goal K-1).**
- Superior Township is working closely with the Superior Township Flemming Creek Advisory Council, a local citizen advocacy group, to coordinate watershed management activities that benefit both the Rouge River and the Huron River watersheds **(Goal K-3).**
- The Novi GIS/Public Awareness Educational Program will develop a limited GIS that will contain the physical features that may impact storm water runoff that will be used as an interactive display located at city hall and through a local cable TV channel **(Recommendation K-2c).**
- In 1999 Wayne County will be adding nature and history exhibits to Nankin Mills, and the building will be open for public visits. Exhibits will focus on the theme, "River Running Through Time," and will feature displays about the changing Rouge River habitat over time **(Recommendation K-1e, K-1k).**
- The Troy Nature Center offers interpretive programming that focuses upon the Rouge watershed and the natural communities surrounding it. They conduct 20 different school programs including pond and stream studies. In addition, there are currently 150 children enrolled in their Junior Naturalist program. Nine thousand school children and 22,000 total visitations all focus on the Rouge River Watershed **(Recommendation K-1k).**
- The FOTR's REP is a school-based, interdisciplinary watershed education and monitoring effort. Presently ninety-six schools and 150 teachers participate in the REP. Over the course of the school year, teachers and students attend a variety of workshops preparing them for the program in May. During this intensive program, students and teachers gain an overview of the Rouge Watershed, take biological and chemical measurements, conduct physical monitoring, exchange information and data over the Internet, and analyze and interpret the data from their school and other schools in the project. They then develop solutions to problems they have found and take actions to address those problems **(Recommendation K-1b).**
- The REP has an interdisciplinary component that incorporates social studies, math, language arts, music, art, and more. Thirty percent of the REP schools have interdisciplinary teams and use an integrative approach. All of this culminates in the Rouge Student Congress. Here, students share their experience and celebrate what they have learned **(Recommendation K-1b).**
- The REP also provides the following educational resources: improved educational materials, various types of workshops and in-service training; resource assistants, stronger relationships with administrators, telecommunications, and educational advancement **(Goal K-1, Recommendation K-1j).**

Students participating in the Rouge Education Project

- HNPA and Westland videos their annual Rouge Rescue effort and shows the videos at their general meetings and on local public access cable channels **(Recommendation K-1c).**

- HNPA petitioned to rename the Morgan Drain in Westland to Morgan Creek. The name change was official on November 6, 1997, and the city will erect a new sign to support this effort **(Recommendation K-1m).**
- In 1998 FOTR initiated a wildlife habitat inventory in the Middle-1 subwatershed. Over 100 citizens, including school and scouting groups, responded to the publicity outreach and attended training workshops. Newspaper publicity surrounding the survey has also helped increase watershed awareness. **(Recommendation K-1b, K-1d).**
- At the suggestion of its members, the SPAC will establish a listserver entitled "MICH-RAP" to provide a forum for sharing news and information related to the AOCs and the Lakewide Management Programs in the state. Postings are intended to include meeting announcements, new publications, grant opportunities, updates on legislative activities, and discussions on RAP and LAMP efforts **(Recommendation K-3b).**

Chapter 6
Enhancement of Recreational Use

"People living in the Rouge River Basin are in the best position to identify basin problems and create solutions to those problems. The Rouge River RAP Advisory Council (RRAC) is composed of people who are knowledgeable about the Rouge River ecosystem. They are also committed to restoration and stewardship of the Rouge River basin. The RRAC members seek to guide actions and projects designed to solve problems and enhance the quality of life of people, plants and animals of the Rouge River basin. Continued collaborative efforts among the communities of the Rouge River Basin hold promise for the solution of complex problems and the preservation, production, and development of resources that are approved and supported by state and federal agencies. The Rouge River RAP appears to ***me to be sailing down the right channels. Let's keep it going!"***

Don A. Griffin
President, Friends of the Rouge

New recreational opportunities

Active recreation is an important component of human culture. Just as significant is the opportunity for passive recreation. Riparian corridors serve essential ecological functions and satisfy human affiliation for natural areas. The availability of unadulterated spaces ensures the chance for human exposure and connection to nature. While it requires conscious planning, both aspects of recreation are complementary to, rather than in conflict with, enriched urban life.

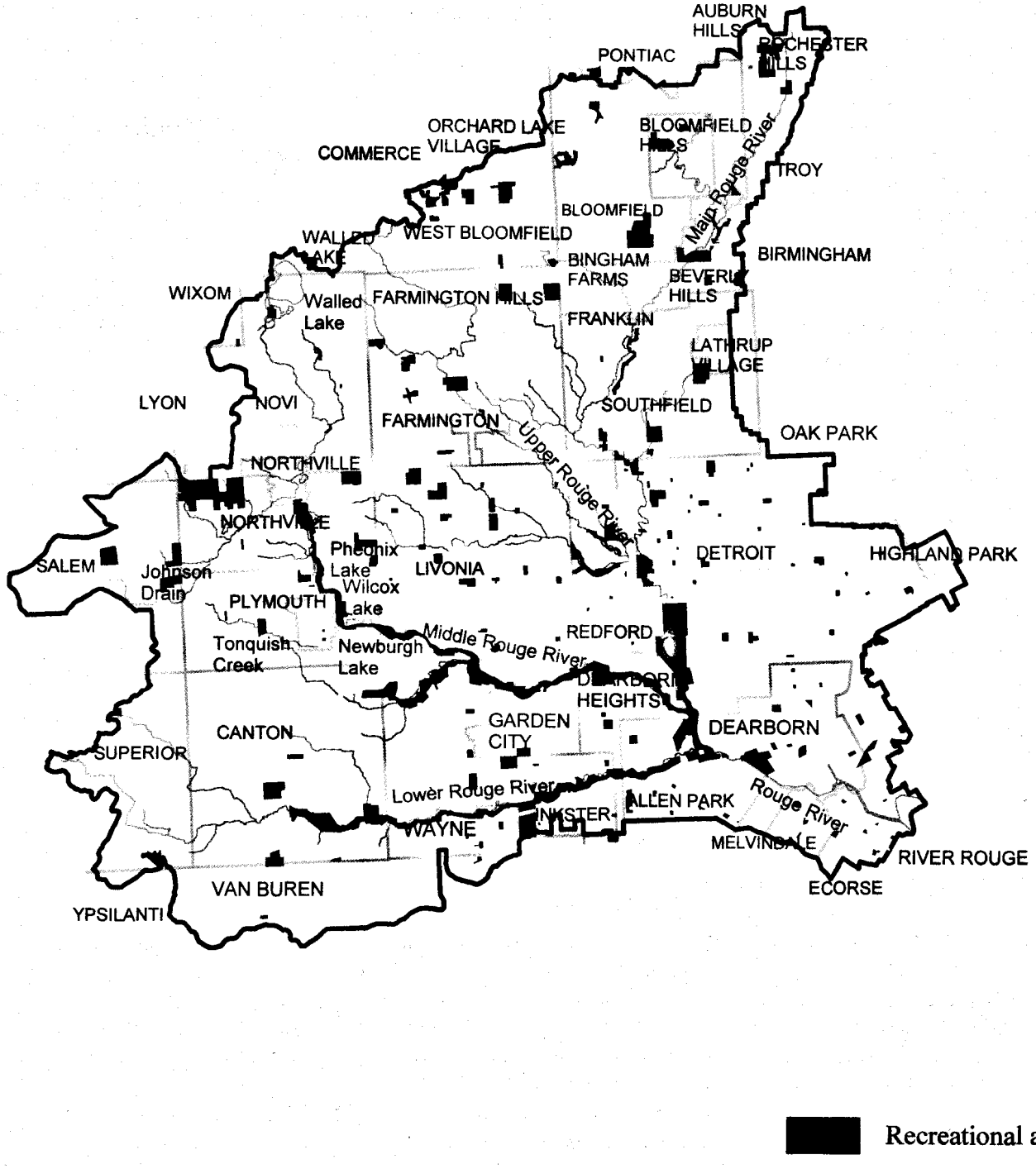
When people enjoy the Rouge River, they are more likely to support efforts to protect it. It is important to provide safe, recreational opportunities that also enhance and protect the river habitat. Recreational use of the river has been severely impaired for many years. As improvements are made, recreational opportunities will be increased. People of the watershed will then be able to visit a local stream and fish, canoe or have a riverside picnic without encountering unpleasant odors or evidence of pollution. Watershed residents should not have to leave Southeast Michigan to find a clean, safe river for recreation. It will take the interest and initiative of all watershed stakeholders for the river to reach its full recreational potential. See Figure 15 for a map showing recreational areas in the watershed.

Fishing at the Farmington/Farmington Hills Trout Derby

The following activities have been conducted to develop recreational opportunities in the Rouge River Watershed:

- Northville is developing a passive recreation project near the Mill Race Historical Village. The $71,000 project will include an observation deck and outdoor classroom, pedestrian river walks and native vegetation plantings. Educational programs will focus on the importance of ecology and the historical significance of the Mill Pond **(Recommendations L-1b, K-1k, K-1p, II-2k).**
- Northville Ford Park Development Passive Recreation Project has restored certain recreational activities along the banks of the river that demonstrate the positive community impact of restoring a public park through the use of native plantings, a pedestrian river walk, and an education program **(Recommendations L-1b).**
- Wayne County Parks and Recreation provided a canoe livery service during dry weather in 1996. (Warnings against contact with the river water during rain events were posted.) The livery service was suspended due to the remediation activities at Newburgh Lake. It will be reinstated in Spring 1999 **(Goal L-1).**
- Wayne County has held a fishing derby since 1996 to promote fishing on the Rouge River **(Recommendation L-2b).**
- Wayne County Parks has created three additional picnic areas **(Recommendation L-1b).**
- The Wayne County park system maintains numerous parks along the Rouge River and in the watershed. These areas include: Holliday Nature Preserve, Hines Park, Lower Rouge Parkway, Bell Creek Park, and Lola Valley Park. Hines Park has 33 baseball diamonds, 5 football/soccer fields, 16 tennis courts, 4 fishing lakes, 8 ice skating areas, 4 sledding areas, and 9 miles of bike trails **(Recommendation L-1b).**
- Wayne County Parks offers a diverse selection of recreational nature program topics for families to enjoy. They also offer week-long summer nature day camp sessions for various age groups. Activities include exploring the watershed **(Recommendation L-1b).**
- Wayne County Parks plans to reintroduce paddle boating to Newburgh Lake in spring 1999 **(Recommendation L-1b).**

Figure 15: Recreational Areas in the Rouge River Watershed



- Detroit Recreation Department has allowed a previously mowed 30-acre parcel of land in Rouge Park to grow naturally. The parcel is located in Rouge Park between Joy Road and Tireman from Outer Drive to Parkland. The area, just above the floodplain, has evolved into a lovely meadow habitat and a diverse number of grassland and prairie plant species has emerged. Numerous bird species and amphibians have been noted. A one-mile nature trail traverses the field. To maintain the meadow environment the area will be mowed on a rotational basis. **(Recommendation L-1b)**.
- At Lahser Road, north of Joy Road, the City of Detroit Recreation Department has allowed 10 acres of Rouge floodplain to grow naturally into a wetland environment. Again there has been an increase in the diversity of plant species, and amphibians have been found at this location as well **(Recommendation L-1b)**.
- Southfield has completed the expansion of their fish habitat improvement project. They created a sequence of deep pools and shallow riffles using wing wall deflectors. They have worked to decrease soil erosion along the banks of the Rouge, from Civic Center Drive north to the I-696 overpass, through the use of riprap and geotextile **(Recommendation L-2c)**.
- In May 1998 the Southfield Recreation Department held its fourteenth annual Rouge River Fishing Derby at Civic Center Drive and Telegraph Road in Southfield **(Recommendation L-2b)**.
- The Southfield Recreation Department created the Valley Woods Nature Trail, located near the site of the annual fishing derby. The trail traverses wetland and meadow habitat and numerous bird and wildlife species can be discovered **(Recommendation L-1b)**.
- In Troy, the headwaters of the Rouge River flow through two major parks. At Firefighters Park the Troy Department of Parks and Recreation worked with the MDNR to improve fisheries and wildlife habitat. To improve water quality, they added riprap to increase aeration, and planted trees for shading along the banks to maintain a cold water environment. They also expanded an area of wetlands **(Recommendation L1-b).**
- The Henry Ford Festival is held every July along the riverfront at the Henry Ford Fair Lane Estate on the campus of the U of M-D. In 1998 a portion of the event was dedicated to "Artists by the River," with the river and surrounding natural area serving as an inspirational setting. Nature walks are also a part of the festival **(Goal L-1, Recommendation K-1o).**
- During the Christmas season, the Henry Ford Fair Lane Estate conducts a "Santa's Workshop" program which includes a walk through the woods and along the river **(Goal L-1).**
- The Henry Ford Fair Lane Estate offers canoe trips, by appointment, to official parties interested in pursuing redevelopment and enhancement of the riverine environment. Currently plans are underway to establish guided boat tours along the Rouge River to explore the history of our industrial heritage along the Rouge River **(Goal L-1).**

Relaxing at the Rouge River in Southfield

- Since 1995, in a cooperative effort between the cities of Farmington and Farmington Hills, an annual trout fishing derby has been held at Shiawassee Park in Farmington. A portion of the river is fenced off and 600 rainbow trout are released into the area. Approximately 400 trout were caught. In an attempt to keep the event small, attendance is limited to the children of Farmington and Farmington Hills. Over 400 enthusiastic children were at the 1998 gathering. In this section of the river, the trout appear to survive from year to year. **(Recommendation L-2b).**
- A private citizen, in cooperation with Northville, has planted a prairie wetland on a small piece of public parkland near the river. A scouting troop is assisting with the plantings **(Recommendation L-1b).**

Chapter 7
Selected Reports and References

"The Federal District Court and its appointed monitors look upon and encourage the increased activities of the RRAC in furtherance of the RAP as an outline of needed activities and a beginning path for carrying out the recommendations of the peer review panel. Increased devotion by the MDEQ and the Wayne County RPO of personnel and funding to this end is respectfully urged."

Charles Moon and Johathan Bulkley
Court Monitors

DNR fish survey

The following is a selected, annotated list of reports and references that were published from early 1995 to August of 1998. Due to the plethora of published material regarding the Rouge River Watershed, this list only includes a small selection of documents.

Combined Sewer Overflows (CSOs)

Implementation of CSO Controls Based on a Watershed Approach (Denver, CO)
Hufnagel, Carol L., Kluitenberg, Edward H., and Vyto P. Kaunelis Paper 5/6/98
7 pgs Order Number: WEF98-03.00
To identify limiting factors that impact river use, a group of water quality indicators and public use categories were developed to provide a measure of existing river quality. The indicators resulted in a good, fair, or poor ranking of the river based on parameters of dissolved oxygen, river flow, bacteria, aquatic life and stream habitat. Use categories were used to rate representative river sites on the basis of fishing, wading/body contact and general aesthetic conditions.

Initial CSO Findings Report
Hufnagel, Carol and Peter Klaver 5/12/97
39 pgs Order Number: CSO-TM14.00
Data collected at several CSO facilities was analyzed to identify the impacts of CSO controls. In particular, the question of the importance of capture of flow volume, versus treatment of CSO discharges, was examined. Several "findings" were identified. This findings included identification of first flush, the importance of optimizing interceptor capacity, the relative impacts of CSO versus storm water loads, and the cause of CSO pollutant load reduction at a CSO basin.

Percent Treated Analysis of Demonstration CSO Control Facilities
Kluitenberg, Edward H., and Vyto P. Kaunelis Paper 6/10/96
4 pgs Order Number: Watershed96-06.00
A model analysis was conducted to determine how the proposed demonstration CSO control facilities in the Rouge River Watershed measure up to the USEPA CSO policy issued in April 1994.

Rouge River National Wet Weather Demonstration Project CSO Basin Evaluation Study (Chicago IL)
Hufnagel, Carol L., Kaunelis, Vyto P., & Suresh K. Sangal Paper 9/16/97
14 pgs Order Number: WEFTEC97-01.00
As part of the Rouge Project, ten CSO retention treatment basins were constructed to control a portion of the CSO discharges. An evaluation of the effectiveness of these facilities will assist in determining the design criteria for future CSO control projects. The evaluation will help to identify the relative impacts of CSO versus storm water discharges, to further facilitate evaluation of various projects on a financial basis. Several CSO facilities are currently in operation as of July 1997 and the remainder will be operational in late 1997 or in 1998. This paper is intended to describe the basin and supporting river monitoring studies and intended outcomes of the evaluation study.

Habitat and Wildlife

Ecological Targets for Rehabilitation of the Rouge River: Part I - Interim Report on Fish Communities and Summer Temperatures: Part II - Interim Report on Discharge Regimes
Wiley, Michael J. and Paul W. Seelbach 9/30/96
55 pgs
Heavy urbanization of the Rouge River Watershed has destroyed or degraded many of the natural functions of this river ecosystem. "Bringing this river back to life" will require restoration of clean oxygenated waters; natural

flow regimes; diverse channel habitats; diverse, productive fish communities; and connection to the Great Lakes for migratory fishes (Beam and Braunscheidel 1996). Part I of this three-part report provides a vision of potential fish communities for specific reaches of the Rouge River as well as target temperature regimes. Part II of the report provides target flow regimes and Part III provides target channel hydraulics adequate for sustaining the target fish communities.

Rouge River Watershed Assessment, 1997
Jennifer Beam and Jeffery Braunscheidel, MDNR-Fisheries Division
The study profiles the river and its fish populations. Researchers identified 53 species of fish in the Rouge River in 1995 surveys, similar to those found in 1986. The greatest gamefish populations were found in the impoundments. In the remainder of the watershed, most fish species were indicative of flashy, warmwater streams. Researchers found that many factors negatively affect fisheries including excessive flow instability, degraded water quality due to input of sewage and storm water, sedimentation from erosion and storm water flows, and fragmentation due to dams, paving of the stream channel, and habitat destruction. The assessment suggests a number of management options to improve the river.

Illicit Connections

From Theory to Implementation-Finding Illicit Connections (Denver, CO)
Johnson Barry & Dean Tuomari Paper 5/5/98
7 pgs Order Number: WEF98-01.00
The Rouge Project illicit connection program has utilized several methods to identify sources of illicit discharges, but first a method to prioritize areas for detailed evaluations had to be developed. A GIS database was established to assist in this area. This paper focuses on five methods used to provide information to prioritize areas of the watershed for detailed investigation. These include dye testing of plumbing and on-site sewage disposal systems, visual observations of manholes, outfalls, and on-site sewage disposal systems; aerial photography; televising of storm sewers; and testing for ammonia, surfactants, E. coli and pH and oxygen.

Illicit Sewer Connection Detection Program: A GIS Application
Tuomari, Dean, Foley John P., and Charles R. Bristol Paper 6/10/96
3 pgs Order Number: Watershed96-03.00
The Rouge Project is investigating nonpoint source (NPS) pollution in the Rouge River Watershed. One objective is the elimination of improper discharges to the separate sewer systems of the watershed. Wayne County has implemented what is known as the Illicit Connection Detection Program as a component of the Rouge Project. This report describes this very successful program.

On-site Sewage Disposal

1995 Rouge River Headwaters On-Site Sewage Disposal System Survey
Krinn, Keith, Carlson William, Petitt Julia, Yates Eric, Bungee Kelly and Brian Allen 3/1/96
28+ pgs Order Number: NPS-SR05.00
This document presents the results of the on-site sewage disposal system survey conducted in Oakland County in 1995. Failing on-site systems are known to be sources of pollutants to local receiving streams. This survey was the continuation of the on-site system survey begun by the Oakland County Department of Public Health in 1994. Results are presented from the surveys conducted to define surface water quality (bacteria, pH, temperature, dissolved oxygen, and turbidity), macroinvertebrate communities, and failure rates of individual on-site sewage disposal systems (dye tests).

Did You Know...The Impact of On-Site Sewage Systems and Illicit Discharges On The Rouge River (Chicago, IL)
Johnson Barry & Dean Tuomari Paper 2/10/98
10 pgs
On-site sewage disposal systems (OSDS) and illicit discharges are major contributors to groundwater and surface water pollution in the Rouge River. The illicit connection program has used several methods to identify these pollutants. This paper presents five methods used by the Rouge Project: dye testing of plumbing and OSDS; visual observations of manholes, outfalls and OSDS; aerial photography; televising storm sewers; and testing for ammonia, surfactants, E. Coli, pH and oxygen.

Sediments

Newburgh Lake Basis of Design
O'Meara John, Tomlinson Michael, Poppleton Jim, Mikesell Mark, & John Michalski 4/25/96
89 + pgs Order Number: NPS-TR09.01
Newburgh Lake is an impoundment in the Middle Rouge River in Livonia, and is part of the Wayne County Park System's Edward Hines Parkway. Newburgh Lake was created in the early 1900s for generating power and sediments have accumulated in this impoundment since then. Some of these sediments contain toxic pollutants that can result in a human health hazard due to the consumption of contaminated fish. The Newburgh Lake Restoration Project has set out to restore the Lake's recreational uses, and address the needs and desires of the public by eliminating these contaminated sediments.

Rouge River Watershed Sediment Reconnaissance Survey
Smith, V. Elliott, Huellmantel Laura Lang, Rathbun Joseph E., Hughes Collen, Zimmerman Paul M., and John Michalski 7/27/95
21+ pgs
A reconnaissance survey was conducted throughout most of the Rouge River Watershed to characterize sediment quality from October 15 to November 11, 1993. Sediment grab samples were collected from 182 locations at approximately one kilometer (0.6 mile) intervals. Priority locations for sampling were instream deposits of soft, oily silt where contaminants were more likely to accumulate. All samples were analyzed for contaminants by quantitative screening methods. Charts, maps, and appendices contain 124 pages.

Storm Water

Adapting Regulatory Frameworks to Accommodate Watershed Approaches to Storm Water Management (Chicago, IL)
Fredericks, Robert H., Cave, Kelly A., & Jack D. Bails Paper 11/5/97
9 pgs
The early focus of the Rouge Project was on the control of CSOs in the older urban core portion of the downstream areas of the Rouge River Watershed. As a finite number of point source CSO discharges could be identified and responsibility for each defined, the traditional regulatory approach of issuing National Pollution Discharge Elimination System (NPDES) permits mandating corrective action worked relatively well. As the concerns expanded to sources of pollution in the upper portion of the watershed (above the CSO discharges), and the water quality improvements focused more on watershed-wide approaches, the lack of a defined regulatory framework to address storm water pollution and diffuse sources of non-point pollution became a major obstacle to further progress in improving water quality and restoring beneficial uses to the Rouge River.

Cost Estimating Guidelines: Best Management Practices and Engineering Controls
Ferguson, Timothy, Gignac Robert, Stoffan Mark, Ibrahim Ashraf and John Aldrich 5/1/97
73+ pgs Order Number: NPS-SR10.00
This manual was designed to assist community planning and public works managers in the development of storm water management programs for their specific concerns. The intent of the manual is to provide an introduction

to, cost information for, and common methods used to control storm water runoff. The manual has been organized into six categories to aid you in identifying specific BMPs.

Improving Community Storm Water Management – A Summary Guide of Ordinances for Rouge River Communities
Rupal S. Pribak RPO-NPS-SR17.00 10/28/97
The guide provides a summary of storm water ordinances currently used in many of the Rouge Watershed communities. It is a tool to aid communities in creating a comprehensive local ordinance, or a series of ordinances, to reduce the adverse effects of storm water runoff. It includes seven topical areas including controlling storm water quantity and quality, soil erosion and sedimentation control, managing on-site sewage disposal systems, protecting wetlands, maintaining vegetative buffer zones, stabilizing streambanks, floodplains/watercourse issues, maintaining docks and other water dependent structures, and establishing wildlife corridors.

One Size Does Not Fit All: Storm Water is a Bigger Issue Since Local Communities Have No Regulatory Requirements Through CSO Controls
Ridgway, James W., Tolpa Robert, Lindquist Ellen, and Roy Schrameck Paper 6/10/96
4 pgs Order Number: Watershed96-07.00
Increased budgetary pressures coupled with new congressional guidance have caused the regulatory agencies to reevaluate the ways in which they manage water resources. This has led to inter-and intra-governmental coordination between federal and state agencies and local units of government; public/private partnerships with the regulated community; and public outreach and education.

Storm Water Management For The Rouge River Watershed "A Cooperative Strategy To Restore The River"
Rouge River National Wet Weather Demonstration Project
4 pgs Order Number: NPS-SR13.00
This document outlines a strategy designed to develop a practical approach to reduce water quality impacts of storm water discharges to the Rouge River through the application of watershed-wide management approaches. A cooperative effort of the affected communities, state, and federal regulators, and other stakeholders in the watershed is outlined. Included in this document are methods for (1) implementing a watershed-wide storm water monitoring program that will efficiently use limited resources to identify problem areas, (2) funding demonstration and pilot projects in selected subwatersheds designed to evaluate the cost effectiveness of alternative approaches to remediate storm water pollution sources, (3) and analyzing current legal options for managing storm water.

Storm Water Permitting: A Watershed Perspective
Murray, James E., Cave Kelly, and John Bona Paper 6/10/96
4 pgs Order Number: Watershed96-01.00
This report details how the Rouge Project has provided a unique opportunity for applying a watershed-wide approach to municipal storm water discharge regulation under the Clean Water Act; addressing the shortcomings of the existing storm water regulatory program as it applies to the Rouge Watershed; and offering solutions for removing the barriers to issuing a watershed-wide storm water permit and the approach taken by the Rouge Project to initiate this permitting process.

Subwatershed Reports
Branch Report of the Lower Rouge River
Rouge River National Wet Weather Demonstration Project 9/97
Summarizes conditions as they currently exist in the Lower Rouge Subwatershed and suggests measures for improving these conditions.

Johnson Creek Reconnaissance Survey
Crawford, Gary & Douglas Denison 4/22/97
22+ pgs Order Number: WMGT-TPM44.00
This memorandum summarizes the assessment of the baseline condition of the mainstream of Johnson Creek. The foundation is based on data collected during an August 1996 field recognizance survey conducted by the Wayne County Rouge Program Office (RPO).

Lower 1 Subbasin Resource Plan, Southeast Michigan River Basin Study
United States Department of Agriculture, Natural Resources Conservation Service 3/97
This report was written to complement existing or ongoing plans and studies and to identify resource problems, concerns, and opportunities in the Lower-1 subwatershed.

Management Study for the Bell Branch and Tarabusi Creek Subwatershed (Draft)
Cave Kelly, VanAllen Michelle, Rohrer Christine, & Jack Bails 10/1/97
91 pgs Order Number: NPS-TPM55.00
The Management Study for the Bell Branch and Tarabusi Creek Subwatershed was prepared by the RPO under the guidance of the Storm Water Advisory Group (SWAG) for the Bell Branch and Tarabusi Creek Subwatershed. The information collected about this subwatershed includes hydrologic, biologic, and water quality data, public use information, inventory of storm water management activities, current and projected land use/land cover, and other material critical to understanding the current state of the river, and problems and opportunities for restoration.

Management Study for the Middle 3 Subwatershed (Draft)
Johnson Barry & Christine Roher 1/17/98
59 pgs Order Number: NPS-TPM50.00
This report shares information on the Middle 3 Subwatershed with local officials, community groups, businesses, environmental organizations, and interested citizens. The report also includes the goals that the Storm Water Advisory Group has endorsed. This study reports on the same categories contained in the Bell/Tarabusi subwatershed.

Middle 1 Subwatershed Management Study
Gallagher Karen, Denison Douglas, & Don Tilton 11/5/97
67 pgs Order Number: NPS-TM23.00
The Middle 1 Subwatershed Management Study, prepared by the RPO and funded by the Rouge Project, describes and illustrates issues associated with this Subwatershed, including the condition of the subwatershed, vision and goals for the future, current 1997 storm water management activities within the Subwatershed; alternative actions to preserve and protect the Subwatershed water quality and character; anticipated benefits of the actions; institutional and financing options, and progress assessment and monitoring opportunities.

Technical Reports

An Aesthetic Quality Index For the Rouge River
Heidtke, Thomas M., and Eric Tauriainen Paper 10/1/96
12 pgs Order Number: WEF96-03.00
This report details information pertaining to the aesthetic state of the river that has been collected by the Rouge Project. More conventional data representing water and sediment chemistry, as well as biological and habitat conditions are also included.

Approach to Simulating the Water Quantity and Quality in the Rouge River
Mercer, Gary 3/21/95
23 pgs Order Number: MOD-TM26.00
A three-tier computer model of the Rouge River Watershed was developed for simulating the pollutant sources and water quality in the Rouge River. Integration of the models into one comprehensive model system using the Linked Watershed Model (LWM) is also discussed.

Communicating Rouge Project Findings: Use of Quality Indicators to Report on Rouge River Status and Trends
Smith, Elliott V. 6/30/97
37+ pgs Order Number: WMGT-TPM42.00
This memorandum describes and demonstrates an indicator approach developed by Rouge River National Wet Weather Demonstration Project (RPO) staff for conveying technical information on watershed quality to the public. The information consists of measurement data and observations of chemical, biological and physical indicators of river quality collected over two years (1994-95) in the Rouge River Watershed.

Innovative Display of Water Quality Data
Rood, Stephen G., and Charles R. Bristol Paper 6/10/96
1 pg Order Number: Watershed96-08.00
The advent of powerful microcomputers coupled with advances in desktop mapping software and integrated software and integrated software development systems has greatly enhanced the ability to display, query and visualize the large data sets inherent in watershed management projects.

Modeling Special Studies 1994-1995: Impoundment Limnological Report
Rathbun, Joseph, Mercer Gary and Sarina Aryan 7/31/96
102 pgs Order Number: MOD-TM10.00
This study reports on the limnological analyses (nutrients, DO, solids, algae, macrophytes, etc.) performed at four lakes along the Middle Branch; Walled Lake, Meadowbrook Lake, Phoenix Lake and Newburgh Lake; between September/October 1994 and August 1995.

Water Quality Modeling to Support the Rouge River Restoration (Chicago, IL)
Kluitenberg, Edward H., Mercer, Gary W & Vyto Kaunelis Paper 2/10/98
14 pgs Order Number: Urban Retro 98-01.00
The Rouge Project has taken on the challenge of implementing river restoration efforts in a highly urbanized watershed. A suite of hydrologic, sewer system and riverine water quality models have been used to address technical questions that have been asked in Rouge River Watershed planning. This paper presents application of four of the models used by the Rouge Project: TRTSTOTM, Watershed Management Model (WMM), Storm Water Management Model (SWMM), and a Water Quality Analysis Simulation Program (WASP).

The Effectiveness of Freshwater Wetlands for Nonpoint Source Pollution Control in the Rouge River Watershed (Cleveland, OH)
Denison, Douglas L., and Donald L. Tilton Paper 6/28/98
10 pgs Order Number: WEF98-04.00
The function of wetland filtration for water quality improvement has been recognized as one potential BMP. Wetlands increase storm water detention capacity, increase storm water attenuation, moderate low flows, and improve water quality by removing nutrients, sediments and metals. The goal of this wetland demonstration project was to evaluate the effectiveness of freshwater wetlands in the treatment of storm water. The wetland demonstration project (WETL-1) utilized existing, enhanced, and created wetlands to demonstrate the value and effectiveness of wetlands in treating storm water runoff.

Watershed Management

Comprehensive Watershed Analysis Tools: The Rouge Project-A Case Study
Mercer, Gary W., Cave Kelly, and Vyto P. Kaunelis Paper 6/10/96
4 pgs Order Number: Watershed96-02.00
The watershed analysis, under the Rouge Project, has developed and applied a comprehensive computer model of the Rouge River Watershed. This model simulates the water quantity and quality responses of the Rouge River to wet weather events for existing and future conditions in the watershed and under various combined sewer overflows (CSO) and storm water management activities.

Consensus Building and Grass Roots Efforts in a Comprehensive Urban Watershed Management Program
Ball, Zachare, Powell Josephine and Jack Bails Paper 6/10/96
3 pgs Order Number: Watershed96-05.00
A Public Involvement Action Plan for the Rouge Project was devised based on a survey of stakeholders living and working in the Rouge River Watershed. The goal of the plan is to inform stakeholders, educate them, change their behavior, and gain their support for achieving and maintaining a healthy river basin.

Development of a Monitoring Program to Support the Rouge River Watershed Management Plan (Denver, CO)
Regenmorter, Louis C., Kaunelis, Vyto P., and Noel F. Mullett Jr. Paper 5/5/98
8 pgs Order Number: WEF98-02.00
The Rouge Project includes an integrated monitoring program. The monitoring program is based on water chemistry sampling results as well as the use of environmental indicators that focus on field conditions and performance indicators that document progress on implementation of selected controls and management activities. The field programs are comprised of monitoring at numerous locations throughout the 467 square mile watershed, and documentation to show compliance with a new general permit for the watershed. This data will be used to compile information for performance indicators.

Meeting Objectives For Watershed Planning: A Decision Assessment Framework
Kaunelis, Vyto, Johnson Carl, Hunscher David, and John Spittler Paper 10/1/96
12 pgs Order Number: WEF96-02.00
The Decision Assessment Framework (DAF) is a decision framework tool aimed at regularly assessing the completeness and relevancy of the Program Team's efforts toward accomplishing the Rouge Program's mission. This paper discusses the process of developing the DAF tool, its usefulness for tracking progress towards intangible targets, the lessons learned, and other concepts relevant to watershed management and planning.

Rouge Project Outreach Binder: Implementing An Urban Watershed Approach
Rouge River National Wet Weather Demonstration Project 2/5/97
90 pgs Order Number: WMGT-SR14.00
This notebook is used to present an overview of the activities being undertaken to restore and protect beneficial uses in the Rouge River under the Rouge Project. The notebook accompanies a slide presentation "Implementing an Urban Watershed Approach" used to describe the Rouge Project, its accomplishments to date and future directions to both local and national audiences. Each section of the notebook corresponds to a slide from the presentation and also contains examples of selected Rouge Project programs and work efforts. The notebook is periodically updated to reflect progress of the Rouge Project in restoring the Rouge River.

The Successes in Implementing an Urban Watershed Approach-The Rouge River National Wet Weather Demonstration Project
Murray, James E., and Dale S. Bryson Paper 10/1/96
6 pgs Order Number: WEF96-01.00
The Rouge River in southeast Michigan does not meet water quality standards. Wayne County applied for and obtained a national demonstration project grant to develop an approach to watershed-wide water quality management that will achieve water quality standards. This report summarizes the successes achieved in implementing the Rouge Project.

Watershed Education and Watershed Management: Using the River as an Interdisciplinary Teaching Tool
Mitchell, K. Mark and James L. Graham Paper 6/10/96
4 pgs Order Number: Watershed96-04.00
The Friends of the Rouge Education Project (REP) began in 1987 with 16 Detroit area high schools and has expanded to include 75 elementary, middle and high schools. The project's interdisciplinary curriculum incorporates chemistry, biology, computer science, mathematics, art, music, and reading and writing skills.

Miscellaneous Reports

Rouge Project Catalog of Watershed Information, Rouge Project 10/97
The catalog is a summary of information available from the project, including documents, data, and maps. Information on ordering specific references is included.

Rouge Watershed Peer Review Findings Report with Recommendations September 23-27, 1996
Meek, Jim, Phillips Nancy, Livingston Eric, Shaver Earl, Schueler Tom, Roseboom Don and Tom Davenport
9/4/96
32 pgs Order Number: WMGT-SR12.00
RPO contracted with the Conservation Technology Information Center (CTIC) for a peer review panel to do an in-depth review of the Project in September of 1996, approximately three years after the project's inception. The review was to evaluate the overall project design, assess the status of implementation, assess institutional arrangements, and make recommendations concerning possible improvements. This report contains the findings of the review team and their recommendations.

Appendices

A Individual NPDES Permits for Discharges to the Rouge River Watershed

B Part 201 (of Act 451 of 1994, as amended) Sites of Environmental Contamination in the Rouge River Watershed

C Contact List

D Committees and Organizations

Appendix A

Individual NPDES Permits for Discharges to the Rouge River Watershed

(Note: excludes permits for CSOs; see Table 5 for CSO control project information)

Designated Name Permit Number	**Type of Discharge and Receiving Water**	**Status**
Amoco Oil Co - Livonia MI0048771	0.028 MGD treated groundwater discharged to Bell Drain.	Terminated 1/2/97.
BFI - Northville MI0045713	0.1 MGD treated groundwater compost pile runoff and an unspecified amount of storm water discharging to Johnson Drain.	Reissued 7/25/97. Storm water management plan and implementation underway; to be completed by 3/21/98.
Buckeye Pipeline - Plymouth MIG080782, formerly MI0049255	0.0288 MGD treated groundwater discharging to the Middle Rouge via an unnamed drain.	Reissued 8/19/97 as a general groundwater cleanup permit.
Commerce Twp WWTP MI0025071	Up to 8 MGD treated municipal wastewater discharging to Seeley Drain, an unnamed tributary of Seeley Drain, and Lake Berry.	Issued 9/30/94. Current permit contested by Farmington Hills and Farmington; resolution expected in 11/1998.
Dearborn CSO Dewatering MI0054356	2.22 MGD treated CSO construction dewatering wastewater.	Issued 1/16/96 as a new use.
DECO - River Rouge Plant MI0001724	0.63 MGD process and storm water discharging to the Rouge River.	Last reissued 8/19/93. Scheduled for reissuance in fiscal year 1998.
Eppert Oil Co - Detroit MI0054658	0.0015 MGD NCCW and an unspecified amount of storm water discharging to the Rouge River via O'Brien Drain.	Issued 5/10/96. Storm water management planning and implementation underway; to be completed by 11/1/98.
Ford Mich Truck Plt MI0003387	550 GPD drinking fountain overflow and an unspecified volume of groundwater seepage and storm water runoff to the Lower Rouge via a storm sewer.	Reissued 5/16/97. Storm water management plan due 8/1/98; implementation to be completed by 8/1/2000.
Ford Rouge Mfg Complex MI0003361	48.19 MGD NCCW and an unspecified amount of storm water runoff discharging to the Rouge River via Roulo Creek.	Reissued 7/22/97. Storm water management plan due 11/1/98; implementation to be completed by 11/1/2000.
GM - Delphi Chassis - Livonia MI0000965	0.3 MGD NCCW, contact cooling water and an unspecified amount of storm water discharging to Newburgh Lake.	Last issued 2/19/87. Under enforcement action due to 7/9/97 oil release. Reissuance on hold.
IPMC Inc MI0000949	1.1 MGD NCCW and 0.15 MGD sand filter backwash water discharging to the Rouge River	Reissued 3/7/97.

Designated Name Permit Number	Type of Discharge and Receiving Water	Status
Nat Steel Corp - GLD - Zug Island MI0026786	Currently authorized to discharge 14 MGD of NCCW and an unspecified amount of storm water and groundwater to the Rouge River. Application request to discharge an additional 1 MGD of wet surface air cooler recycle blowdown.	Last reissued 9/3/93. Application for reissuance (with increased use) under review. Expected reissuance in FY98.
Norfolk & Western RR MI0027626	0.125 MGD treated rinse water and storm water, discharging to the Rouge River.	Reissued 6/20/97. Subsequent modification request denied.
Peregrine Inc- Livonia, formerly GM - Inland Div - Livonia Trim Plt MIG250068, formerly MI0000973	0.0675 MGD NCCW, drinking fountain overflow, fireline test water and an unspecified amount of storm water discharging to the Middle Rouge	Reissued as a general permit for NCCW on 12/20/96.
Plymouth Industrial Center MI0047210	0.072 MGD treated groundwater discharging to the Middle Rouge via storm sewers.	Reissued 7/22/97.
Power & Utility Op - Rouge CPLX MI0050903	18.663 MGD NCCW, boiler blowdown, boiler treatment wastewater, and vacuum eductor aspirator wastewater and an unspecified amount of storm water discharging to the Rouge River.	Reissued 7/22/97. Storm water management plan due 11/1/98; implementation to be completed by 11/1/2000.
Rite On Industries Inc MI0054674	Unspecified amount of treated storm water and groundwater seepage discharging to the Rouge River via Prindle Drain and Livonia - Ashcroft Drain.	Issued 8/6/96 as a new use.
Rouge Steel Co MI0043524	425.1 MGD treated process wastewater, blast furnace recycle blowdown, excess mill water, contact cooling water, NCCW and an unspecified amount of storm water discharging to the Rouge River.	Reissued 7/22/97. Storm water management plan due 11/1/98; implementation to be completed by 11/1/2000.
Rouge - USX Corp - Double Eagle MI0044415	2 MGD treated process wastewater and NCCW, NCCW recycle system blowdown, and an unspecified amount of storm water runoff discharging to the Rouge River.	Reissued 7/22/97.
Salem Twp WWTP MI0054798	0.07 MGD (design flow) treated municipal wastewater discharging to unnamed tributary of Johnson Drain via a storm sewer.	Issued 7/3/96.
Shell Oil Co - Detroit MIG670079, formerly MI0000469	Unspecified amount of storm water runoff (not regulated under federal categorical standards) and hydrostatic pressure test water.	Reissued as a general permit for hydrostatic pressure test water on 9/2/97.

Designated Name Permit Number	Type of Discharge and Receiving Water	Status
Solder Craft Inc MI0036081	0.115 NCCW and an unspecified amount of storm water discharging to the Middle Rouge River.	Issued 9/25/96. Storm water management planning and implementation underway; to be completed by 3/22/98.
South Lyon Community Schools MI0027081	0.005 MGD sanitary wastewater, now treated by the Salem Township WWTP (MI00554798.)	To be terminated.
St Marys Cement Co MI0004243	1.9 MGD NCCW and truck and wheel wash water and an unspecified amount of building sump water and storm water discharging to the Rouge River.	Reissued 3/11/97. Storm water management plan due 4/1/98; implementation to be completed by 4/1/2000.
Steel Technologies Inc MIG250070, formerly MI0053775	NCCW discharging to McKinstry Drain.	Reissued 8/18/97 as a general permit for NCCW.
Textron Inc Walled Lake MI0054950	0.216 MGD treated groundwater discharging to an unnamed pond and creek tributary to Walled Lake.	Issued 9/20/97 as a new use.
Unisys Corp - Plymouth Plt MI0002275	0.128 MGD NCCW, treated groundwater and carbon unit backwash water and an unspecified amount of storm water discharging to the Middle Rouge via storm sewers.	Reissued 6/12/97.
YCUA Regional WWTP MI0042676	58 MGD (design flow) treated municipal wastewater discharging to the Lower Rouge River.	Reissued 7/25/97. Chronic toxicity testing due 10/1/98. Storm water management plan due 10/1/99; implementation to be completed by 10/1/2001.

Appendix B
Part 201 (of Act 451 of 1994, as amended) Sites of Environmental Contamination in the Rouge River Watershed

The following sites are known locations of environmental contamination in the Rouge River Watershed. Environmental contamination means the release of a hazardous substance, or the potential release of a discarded hazardous substance, in a quantity that is or may become injurious to the environment or to the public health, safety, or welfare. Please note that this list may not be complete. It includes sites listed on MDEQ-ERD's list of contaminated sites. There are no doubt unknown sites of contamination in the Rouge Watershed that are not included. In addition, some sites (especially those near the border of the watershed) may also be omitted or erroneously included. For more information about contaminated sites in Michigan, contact MDEQ-ERD or visit their website at *http://www.deq.state.mi.us/erd/.*

This list also does not include sites where leaking underground storage tanks (USTs) and aboveground storage tanks (ASTs) have caused contamination. These sites can be found through the MDEQ-STD's webpage at the following address: *http://www.deq.state.mi.us/std/lust/lustlist.html.*

Part 201 (of Act 451 of 1994, as amended) Sites of Environmental Contamination in the Rouge River Watershed

SITE ID	SITE NAME	LOCATION	SOURCE	ACTION
630001	11 Mile and Orchard Lake Road	Farmington Hills	Nonclassifiable establishments	Eval./Interim Resp. PRP/Other
820143	ABC Drum and Barrel - Birwood	Detroit	Scrap and waste materials	Eval./Interim Resp. PRP/Other
820148	Accu Park	Detroit	Soap and other detergents	No Actions Taken
821493	Accurate Machine Services	Livonia	Miscellaneous metal work	No Actions Taken
821532	Allied Signal - Zug Island	Detroit	Petroleum and coal products	No Actions Taken
820224	Ambassador Bridge Customs Facility	Detroit	General government	Final cleanup - PRP/Other
630088	American Screw Products Former	Farmington	Screw machine products	Eval./Interim Resp. PRP/Other
820161	American Tube & Wire Fabricators	Plymouth	Metal working machinery	No Actions taken
820147	Amsted Industries	Livonia	Paints and allied products	Eval./Interim Resp. PRP/Other
821505	Anaconda Brass	Detroit	Primary metal products	Eval./Interim Resp. PRP/Other
630004	Anderson Heat Treat		Metal coating	Eval./Interim Resp. PRP/Other
630005	Anderson Municipal Landfill	Novi Township	Refuse systems	No Actions Taken
810004	Arbor Hills - East	Salem	Landfill	Eval./Interim Resp. PRP/Other
630958	Arnie's Tire & Service Center	Farmington Hills	Automotive repair shops	No Actions Taken
820058	Beta Chemical Detroit	Detroit	Chemical product manufacturing	Eval./Interim Resp. PRP/Other
630998	Birmingham Cleaners (Bloomfield)	Bloomfield	Dry cleaning plants	Eval./Interim Resp. PRP/Other
821422	Buckeye Pipeline Company	Plymouth	Pipelines	Eval./Interim Resp. PRP/Other
630012	By Rite Oil company		Petro bulk storage	Eval./Interim Resp. PRP/Other
820064	By Rite Station Westland	Westland	Gas station	No Actions Taken
820181	Chem Central Romulus	Romulus	Chemicals and allied products	Eval./Interim Resp. PRP/Other
820151	Chesapeake Properties	Detroit	Industrial buildings and warehouses	No Actions Taken
820008	Chevy Livonia Plant	Livonia	Plating polishing	Eval./Interim Resp. PRP/Other
810407	Conrail Willow Run Yard	Ypsilanti	Switching and terminal service	Eval./Interim Resp. PRP/Other
820227	Contaminated Fill Near Beitz Creek	Livonia	Refuse systems	Eval./Interim Resp. PRP/Other
820010	Cooper School Site	Westland	Refuse systems	Eval./Interim Resp. PRP/Other
820035	Cyanokem	Detroit	Hazardous waste facility	Eval./Interim Resp. PRP/Other
820011	Dearborn Refining Co.	Dearborn	Oil recycling	No Actions Taken
821522	Deluxe Check Printers Inc.	Redford	Commercial printing	Eval./Interim Resp. PRP/Other
821546	Detroit Commerce Park	Detroit	Miscellaneous services	No Actions Taken
820222	Detroit Diesel Corporation	Detroit	Motor vehicle parts	Eval./Interim Resp. PRP/Other
820133	Detroit Metropolitan Building	Detroit	Industrial buildings & warehouses	Eval./Interim Resp. - Funds
820197	Detroit River Paper	Detroit	Paper and Allied products	Eval./Interim Resp. PRP/Other
820173	Detroit Strip Cyclops Steel	Detroit	Metal processing	No Actions Taken
820201	Dexco Corporation	Detroit	Plating and polishing	Eval./Interim Resp. PRP/Other
820013	Dial Trucking	Plymouth	Hazardous waste hauling	No Actions Taken
821526	Ely Fuel Inc.	Northville	Petroleum and coal products	Eval./Interim Resp. PRP/Other

SITE ID	SITE NAME	LOCATION	SOURCE	ACTION
820200	Enterprise Oil	Detroit	Petroleum and coal products	Eval./Interim Resp.-PRP/Other
820184	Eumet Recycling	Detroit	Misc. manufacturing industries	Eval./Interim Resp.-PRP/Other
821510	Facet Enterprises Former	Detroit	Motor vehicle parts	Eval./Interim Resp.-PRP/Other
820106	Fairlane Car Wash Amoco #7217	Dearborn	Gasoline service station	Final Cleanup-PRP/Other
821427	Feister Oil Company	Westland	Petroleum bulk stations and ter.	Eval./Interim Resp.-PRP/Other
820176	Freedland Industries	Dearborn	Steel wire and related products	No actions taken
820208	General Oil Northville	Northville	Petroleum products	Eval./Interim Resp.-PRP/Other
630048	GM Truck and Bus Pontiac Central	Pontiac	Auto manufacturing	No actions taken
820225	GTE Products Ford Road Facility	Dearborn	Stone, clay and glass products	Eval./Interim Resp.-PRP/Other
821499	Heavy T's	Detroit	Automotive services	No actions taken
820085	Henry's Service Center	Wayne	Automotive repair	Eval./Interim Resp.-PRP/Other
820160	Inkster and Schoolcraft Rd. Contam	Livonia	Petroleum bulk stations and ter.	Eval./Interim Resp.-PRP/Other
820020	Inkster Gasoline Leak	Inkster	Gasoline service station	No actions taken
820023	K and J Landfill	Canton	Refuse systems	No actions taken
820832	Kelsey Hayes Romulus Facility	Romulus	Motor vehicle parts	Eval./Interim Resp.-PRP/Other
820153	Lear Siegler Plant	Detroit	Motor vehicle parts	Eval./Interim Resp.-PRP/Other
820076	Marathon Pipeline Crystal Mines	Detroit	Petroleum refining	Eval./Interim Resp.-PRP/Other
820149	Marathon Refinery Tank Farm	Detroit	Petroleum refining	No actions taken
821430	Marquette and Hanlon Rd. NE Corner	Westland	Elementary/secondary schools	Eval./Interim Resp.-PRP/Other
820163	MDES Facility Dix Ave.	Detroit	Refuse systems	Eval./Interim Resp.-PRP/Other
821536	Mendrek Dump Former	Romulus	Nonclassifiable establishments	No actions taken
820030	MichCon Gas Company Station H	Detroit	Coal gasification	No actions taken
820031	MichCon Gas Company Station J	Detroit	Coal gasification	Eval./Interim Resp.-PRP/Other
821566	Michigan Ave. Former Greenhouse	Inkster	Retail building materials and garden	Eval./Interim. Resp.-Funds
820126	Michigan Bell Telephone Co.	Plymouth	Communication	Eval./Interim Resp.-PRP/Other
820182	Michigan Recovery Systems	Romulus	Chemicals and allied products	Eval./Interim Resp.-PRP/Other
820207	Middlebelt Hill	Westland	Refuse systems	Eval./Interim Resp.-PRP/Other
630949	Mobil #99-Nov. (Former)	Novi	Gasoline service station	Eval./Interim Resp.-PRP/Other
820226	Mobil Oil Terminal	Dearborn	Petroleum bulk stations and ter.	Eval./Interim Resp.-PRP/Other
820063	Mobil Station Livonia	Livonia	Gasoline service station	Eval./Interim Resp.-PRP/Other
630040	Munns Landfill Section 23	Novi	Landfill	Eval./Interim. Resp.-Funds
820070	Munoz Machine Shop Livonia	Livonia	Tool and die	Eval./Interim Resp.-PRP/Other
821535	Nankin township Landfill	Wetland	Nonclassifiable establishments	Eval./Interim Resp.-PRP/Other
820034	National Airport Site	Westland	Airport	Eval./Interim Resp.-PRP/Other
820036	Norfolk and Western Railroad	Melvindale	Petro bulk storage	No actions taken
810030	Old Ypsilanti Twp. Sludge Dspt.	Ypsilanti	Wastewater treatment	
820071	Payless Service Station	Detroit	Gasoline service station	Eval./Interim Resp.-PRP/Other

SITE ID	SITE NAME	LOCATION	SOURCE	ACTION
820206	Peerless Dist.	Detroit	Refuse systems	Eval./Interim Resp.-PRP/Other
821502	Peterson Property Landfill		Refuse systems	No actions taken
820044	PIC Holding Company	Plymouth	Paint shop	Eval./Interim Resp.-PRP/Other
821507	Porterfield's Marina Village	Detroit	Unknown	Eval./Interim Resp.-PRP/Other
820072	Prospect St. Dearborn	Dearborn	Unknown	No actions taken
820211	R. E. Leggette Company	Dearborn	Misc. manufacturing industries	Eval./Interim Resp.-PRP/Other
821494	Reclamation Company	Detroit	Chemicals and Allied products	Eval./Interim Resp.-PRP/Other
821562	Red Spot Paint Company	Westland	Paints and Allied products	Eval./Interim Resp.-PRP/Other
820047	Rouge River	Melvindale	Multiple establishments	Eval./Interim Resp.-Funds
810033	Salem Landfill	Salem	Refuse systems	Eval./Interim Resp.-PRP/Other
821517	Satellite Bowl	Dearborn Heights	Unknown	Eval./Interim Resp.-PRP/Other
630857	Selastomer Former	Farmington Hills	Plastic products	Eval./Interim Resp.-PRP/Other
820217	Servco	Inkster	Screw Machine Projects	Eval./Interim Resp.-PRP/Other
630862	Shell Dry Well 1 Telegraph	Bloomfield Hills	Auto service	Eval./Interim Resp.-PRP/Other
821488	Southland Corp. Telegraph Oxford	Dearborn	Gasoline service station	Eval./Interim Resp.-PRP/Other
821557	Stramaglia Property	Detroit	Motor vehicle and car bodies	Eval./Interim Resp.-Funds
821524	Sunny Village Dry Cleaners	Plymouth	Coin laundry and dry cleaners	Eval./Interim Resp.-PRP/Other
821561	Telecraft Shopping Center	Redford	Coin Laundry and dry cleaners	Eval./Interim Resp.-PRP/Other
820050	Trilex	Canton	Plating and polishing	No actions taken
820164	U. S. Industries	Detroit	Primary metal industries	No actions taken
820053	Unistrut Corporation	Wayne	Metal processing	Eval./Interim Resp.-PRP/Other
820172	Unisys Burroughs Landfill	Plymouth	Refuse systems	Eval./Interim Resp.-PRP/Other
820110	Vacant Property Ann Arbor Trail	Westland	Unknown	Eval./Interim Resp.-PRP/Other
821425	Van Dresser Corp.	Westland	Unknown	Eval./Interim Resp.-Funds
820054	Van Born and Lilly Rd. Site		Refuse systems	Eval./Interim Resp.-PRP/Other
821531	Victory Auto Sales	Wayne	New and used car dealers	No actions taken
821523	Warehouse Club Redford	Redford	General merchandise stores	Eval./Interim Resp.-PRP/Other
821537	Warrendale Rouge Dump		Amusement and recreation services	Eval./Interim Resp.-Funds
820145	Welcome Center Ambassador Pro.	Detroit	Nonclassifiable establishments	Eval./Interim Resp.-PRP/Other
821486	Wester Wayne Correctional Facility	Plymouth	Correctional institutions	Eval./Interim Resp.-Funds
820125	Wilow Run Airport East	Ypsilanti	Air transportation	Eval./Interim Resp.-PRP/Other
810048	Willow Run Creek Area	Ypsilanti	Nonclassifiable establishments	Final Cleanup-PRP/Other
820215	Wolverine Gaskett Company	Inkster	Misc. manufacturing industries	Final Ceanup-PRP/Other

Appendix C
Contact List

The following are individuals and organizations to contact for more information:

Friends of the Rouge
Jim Graham, Executive Director ..... (734) 792-9900

International Joint Commission
John Hartig ..... (313) 226-2170 x 6711

Natural Resources Conservation Service
Steve Olds, District Conservationist ..... (734) 761-6722

Oakland County Health Department
Al Drenchen ..... (248) 424-7187

Rouge RAP Advisory Council and
Washtenaw County Department of
Environment and Infrastructure Services
Richard Badics, RRAC Chairperson ..... (734) 971-4542 x2001

Rouge River RAP Coordinator
Cathy Bean, MDEQ-SWQD ..... (734) 953-1441

Rouge River Archive at Wayne State University
Tom Heidke, Associate Professor ..... (313) 577-3854

Rouge River Watershed Soil Erosion and Sedimentation
Control Core Group
Martin Hendges, MDEQ-SWQD ..... (734) 953-1470

Rouge Program Office and Rouge Project
(the Rouge River National Wet Weather Demonstration Project) ..... (313) 961-0700

SEMCOG
Ted Starbuck, Senior Environmental Planner ..... (313) 961-4266

Southeast Michigan Land Conservancy
Jack Smiley, Executive Director ..... (313) 582-8377

University of Michigan - Dearborn Environmental Interpretive Center
Orin Gelderloos, Director of Environmental Studies ..... (313) 593-5339

Wayne County Department of Environment
Noel Mullett ..... (313) 964-8868

Appendix D
Committees and Organizations

There are many committees, organizations, and agencies involved in the restoration of the Rouge River Watershed. The following are the main committees and organizations involved in the process:

The **Rouge River RAP Advisory Council (RRAC)** is a multi-stakeholder group that advises federal and state governments and serves as a public forum on Rouge River restoration and protection issues related to the Rouge River RAP. The RRAC has five subcommittees dealing with contaminated sites, nonpoint source pollution, habitat and headwaters, public education, and on-site sewage disposal systems. The RRAC meets bimonthly and all meetings are open to the public. A list of members is included on page 101.

The seven **Subwatershed Storm Water Advisory Groups (SWAGs)** were formed to address storm water runoff cooperatively on a subwatershed basis. Most municipalities and agencies in the watershed are participating in one or more of these groups. SWAG communities and agencies plan to develop their own storm water management programs under the MDEQ's Voluntary General Storm Water Permit.

The **Rouge Program Office (RPO)** is a group of professional staff and consultants managed by the Wayne County Department of Environment to administer the Rouge River National Wet Weather Demonstration Project (Rouge Project). The RPO directs federal matching grants to municipalities, county agencies, and nonprofit groups. The work of the RPO reflects the goals of the Rouge RAP.

The **Friends of the Rouge (FOTR)** is a nonprofit organization formed in 1986. Its annual Rouge Rescue rallies thousands of citizens to remove obstructions and debris from the river. Its programs include storm drain stenciling, neighborhood-based adopt-a-stream and pollution prevention, public outreach through the River Stewards program, and its renowned school-based Rouge Education Project. The group is supported by memberships, contributions, and grants.

The **Federal Court Rouge River Planning and Coordinating Committee** is an outgrowth of a federal lawsuit over CSO controls that involves many Rouge Watershed communities. The committee is encouraging the control of storm water and the pollutants it carries to the Rouge River. The committee's executive board is chaired by the federal court monitor Jonathon Bulkley. Meetings are open to the public.

Rouge RAP Advisory Council

Delegates	Alternates
Industrial Representatives	
Tim Westerdale General Oil Company (734)266-6500	Bonnie Hollander General Oil Company (734)266-6500
Dan Ballnik Ford Motor Company (313)248-8606	George Rinke Ford Motor Company (313)248-9675
Citizen Representatives	
Meroe Kaericher Salem Township (734)459-5386	Janet Bernardino Salem Township (248)437-0752
Barbara Goryca Dearborn League of Women Voters (313)274-3144	
Joan Lintelman Livonia (734)425-1646	
Developer	
Steven Schafer Phoenix Land Development (248)851-9900	Scott Drumm Phoenix Land Development (248)851-9900
Engineering Consultant	
Dick Wolinski Applied Science & Technology (810)225-2800	
Parks and Recreation Department	
Hurley Coleman Wayne County Parks and Recreation (734)261-2022	Nancy Darga Wayne County Parks and Recreation (734)261-2025
Ernest Burkeen Detroit Parks and Recreation (313)224-1123	Larry Truel Detroit Recreation Department (313)852-4520
Merrie Carlock Southfield Parks and Recreation Department (248)354-9518	
Environmental Health Professional	
VACANT	

Delegates	Alternates
Health Departments (Wayne and Oakland Counties)	
Tom McNulty Wayne County Health (734) 727-7439	Raj Sinha Wayne County Health (734) 727-7442
Al Drenchen Oakland County Health (248) 424-7187	Amy Heiden Oakland County Health (248) 424-7093
Washtenaw County Environmental Services (Environmental Health / Drain Commission)	
Rich Badics (Chair, Rouge RAP Advisory Council) Department of Environment & Infrastructure Services (734) 971-4542 ext. 2001	
Wayne County Department of Environment	
Noel Mullett Department of Environment (313) 964-8868	Robert Fredericks Department of Environment (734) 326-4494
Oakland County Drain Commission	
Phillip Sanzica Oakland County Public Works (248) 858-1031	Shoma Jha Oakland County Public Works (248) 975-9520
Detroit Water and Sewerage Department	
Kathleen Leavey Detroit Water and Sewerage (313) 224-4784	Lucille Walker Detroit Water and Sewerage (313) 964-9349
Natural Resources Conservation Service	
Steve Olds Natural Resources Conservation Service (734) 761-6722	Joe Luellen Natural Resources Conservation Service (734) 761-6722
Environmental Groups	
Jack Smiley Southeast Michigan Land Conservancy (313) 582-8377	
Jim Graham Friends of the Rouge (313) 792-9900	
Bill Craig Holliday Nature Preserve Association (248) 476-5127	
Student	
VACANT	

Delegates	Alternates
Environmental Attorney John Donohue (248) 851-9500	
Academic Representatives Dr. Orin Gelderloos University of Michigan-Dearborn (313) 593-5339	Dr. Kent Murray University of MI-Dearborn (313) 436-9129
Dr. John Hartig (Vice-chair, RRAC) Wayne State University & International Joint Commission (313) 226-2170 ext. 6711	
High School Teacher Tracy Cyr Friends of the Rouge - Rouge Education Project (313) 792-9626	
Local Government Representatives Tom Casari Canton Township (734) 397-5405	Kelly Kelly Canton Township (734) 397-5438
Coco Siewert Birmingham (313) 577-5168	Dennis Dembiec Birmingham (248) 644-3865
Jeannine Ansley Melvindale (313) 381-2835	
Ted Starbuck Southeast Michigan Council of Governments (313) 961-4266	Amy Hamann SEMCOG (313) 961-4266
Ex-Officio Members	
Michigan Department of Environmental Quality Cathy Bean, Rouge RAP Coordinator Surface Water Quality Division (734) 953-1441	Roy Schrameck, District Supervisor Surface Water Quality Division (734) 953-1431
USEPA Quinton White USEPA-Region V (312) 886-0135	
Federal Court Representatives Chuck Moon Dickinson Wright, LLP (313) 223-3684	Terry Donnelly Dickinson Wright, LLP (313) 223-3736
Jonathon Bulkley University of Michigan (734) 764-3198	

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